

**WATER RESOURCE INVENTORY AND ASSESSMENT**

**ARCTIC NATIONAL WILDLIFE REFUGE**

**1990 Stream Discharge Gaging Data**

**Alaska Fisheries Progress Report**

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## 1990 STREAM DISCHARGE

### Introduction

This progress report is intended to provide an accounting of the accomplishments made during the third year of a multi-year water resource inventory on the coastal plain (1002 area) of the Arctic National Wildlife Refuge (ANWR). This progress report is intended to provide stream discharge and water temperature data for consideration in other inventory or management activities. The data represents the hydrologic conditions for the 1990 summer season.

The 1002 area of the Arctic National Wildlife Refuge is located in the remote northeast corner of Alaska adjacent to the Beaufort Sea. Because of the remoteness, extreme climatic conditions, small populace, and lack of competitive water use in the past, there has been little interest in the water resources (water yields, discharge rates, flood frequencies, etc.) from state, federal, or private agencies. The nearest stream gaging station (U.S. Geological Survey gage #15908000, Sagavanirktok River) is located 80 miles to the west of the Canning River, the western boundary of the 1002 area. The Sagavanirktok River is larger than any river in the 1002 area, therefore the database of the Sagavanirktok River can not be extrapolated to provide discharge and flood information for the rivers in the 1002 area.

Hydrologic data for the 1002 area is limited. Childers et al. (1977) reported a reconnaissance level investigation of rivers, springs, aufeis fields, and lakes of the Arctic coastal plain including the 1002 area. Childers et al. (1977) reported data on channel characteristics, watershed characteristics, and estimated flood characteristics of the Canning River, Marsh Creek, Sadlerochit River, Hulahula River, Jago River, and Okerokovik River. Childers et al. (1977) also reported discharge rates and selected water quality parameters for the Katakturuk River Springs, Sadlerochit Springs, Hulahula River Spring, and Okerokovik River Springs. Six lakes were sampled for water quality, and ice thickness and lake depths were reported.

Daum et al. (1984), Glesne and Deschermeier (1984), and Smith and Glesne (1982) reported selected physical and chemical characteristics of streams and springs across the 1002 area. Elliott and Lyons (1990) reported on the availability of winter water within stream systems within the 1002 area. The quantity and distribution of water within lakes of the 1002 area was conducted and reported by Elliott (1990), and Trawicki et al. (1991).

There are no precipitation gages located within the 1002 area. The closest precipitation gage is located on Barter Island, and is operated by the U.S. Soil Conservation Service (SCS). The SCS maintains six other precipitation gages in the Arctic region located at: Atigun Camp, Atigun Pass, Barrow, Prudhoe Bay, Sagwon, and Toolik River. The data collected from these gages is not representative of precipitation events that occur in the drainage basins of the 1002 area. A combination of the data from the SCS precipitation gages located in the Arctic region provide a general indication of seasonal and annual precipitation accumulation for region.

U.S. Fish and Wildlife Service (1989) and Lyons (1990) collected and reported discharge and temperature data for several rivers and streams in the 1002 area for the calendar years of 1988 and 1989 respectively. This progress report is a continuation of these studies. The objectives of the 1990 activities were to continue the quantification of water yield and seasonal stream discharge and to measure stream water temperatures of watersheds within the 1002 area of the ANWR. At the conclusion of the multi-year water resource inventory stream discharge rates, discharge frequency distributions, average monthly water yields, and flood frequencies and sizes will be quantified.

### Methods

The Water Resources Branch initiated a stream gaging network consisting of eight gaging stations in the 1002 area in 1988. In 1989 the stream gaging network was expanded to 10 gaging stations (Figure 1). The new gaging stations were located on the Niguanak and Sikrelurak Rivers. Stream discharge data was collected for the Tamayariak River, West Fork of Itkilyariak Creek, Sadlerochit River, Sadlerochit Spring Creek, Akutoktak River, Niguanak River, and Sikrelurak River. Table 1 contains the legal description of the location of each stream gage. Since the Tamayariak River is a hydrologically diverse system with abundant fish and wildlife resources, four stream discharge gages were installed on this watershed.

Water depth was measured at all ten gaging stations using submerged pressure transducers. Eight gaging stations were also equipped with temperature thermistors. Each pressure transducer and temperature thermistor was connected to a computerized field recorder. Measurements were taken at five minute intervals. Water depth was measured to the nearest 0.01 ft and temperature to the nearest 0.1°C. The field recorder

Table 1.-Stream gaging station locations.

| Watershed                         | Gage Location   |
|-----------------------------------|---|
| Akutoktak River                   | Center Sec. 36, T6N, R33E   |
| West Fork, Itkilyariak Creek      | NE $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 33, T6N, R31E |
| Niguanak River                    | NW $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$ Sec. 36, T8N, R36E |
| Sadlerochit River                 | NW $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 31, T4N, R32E                  |
| Sadlerochit Spring Creek          | NE $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 36, T4N, R31E                  |
| Sikrelurak River                  | SE $\frac{1}{4}$ SE $\frac{1}{4}$ Sec. 36, T7N, R38E                  |
| Tamayariak River                  | SW $\frac{1}{4}$ NE $\frac{1}{4}$ Sec. 35, T6N, R26E                  |
| Lower West Fork, Tamayariak River | NW $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 12, T7N, R25E                  |
| Middle Fork, Tamayariak River     | Center Sec. 12, T7N, R25E   |
| Upper West Fork, Tamayariak River | W $\frac{1}{2}$ W $\frac{1}{2}$ Sec. 33, T6N, R25E                    |

summarizes the data automatically for each 24 hour period into a report that includes: average depth, maximum depth, time of maximum depth, minimum depth, time of minimum depth, average temperature, maximum temperature, time of maximum temperature, minimum temperature, and time of minimum temperature. This data is stored on a data storage pack that can later be down-loaded onto a computer.

Weekly visits were scheduled to each gaging station to collect calibration data. More frequent visits were made to each gaging station during extreme high or low flow periods to increase the range of calibration data collected. Calibration data were collected using standard stream discharge measurement procedures (Buchanan and Somers 1969, and Lyons 1988) and included stream discharge in cubic feet per second (cfs), water depth, and water surface elevation. Through regression analysis of water depth ( $x$ ) and stream discharge ( $y$ ), a linear or polynomial regression equation was obtained for each stream gage. Using the regression equation developed for each stream, water depth data collected by each field recorder was converted to stream discharge.

Average daily discharge was estimated for gaging stations that experienced technical problems during the stream gaging period. A linear relationship was established between a stream with missing records and a stream with similar watershed characteristics and discharge rates. The relationship was established from the average daily discharge for all days that the two streams had recorded records in common. The linear relationship was used to estimate the missing average daily discharge of one stream from the known average daily discharge of the other stream.

### Results

All ten stream gaging stations were installed by June 13, 1990, and most were in service until September 19, 1990. Calibration data was collected from June 13 through September 3. Additional calibration data was collected during high and low flow periods, increasing the range of calibration. From the calibration data polynomial regression equations were obtained for each stream gaging station (Table 2), except for Sadlerochit Spring Creek, where a linear relationship was used. The coefficients of determination ( $R^2$ ) ranged from 0.949 to 0.999. Utilizing these regression equations, water depth measurements recorded with the stream gaging equipment were converted to stream discharge (Appendix A).

In general, 1990 has the lowest discharge records for the three years of data collection. The average daily discharge of the Tamayariak River and Sadlerochit Springs (Figures 2 and 3), clearly show the extreme low flows of 1990 as compared with 1988 and 1989 average daily discharges. Figures 2 and 3 are also representative of the variability in discharge for the three years of record for all streams within the 1002 area. Discharge measurements of zero or less than one cubic feet per second (cfs) were recorded at several gaging stations: Akutoktak River, West Fork Itkilyariak Creek, Niguanak River, Sikrelurak River, Middle Fork Tamayariak River, and

Table 2.-Regression equations from stream discharge calibration data.

| Watershed                         | Regression Equation                          | R <sup>2</sup> |
|-----------------------------------|--|----------------|
| Akutoktak River                   | $Y = -14.7 + 105.4x - 94.9x^2 + 23.0x^3$     | 0.999          |
| West Fork, Itkilyariak Creek      | $Y = 13.2 - 55.3x + 47.5x^2 + 21.0x^3$       | 0.995          |
| Niguanak River                    | $Y = 1120.6 - 788.8x + 136.5x^2$             | 0.996          |
| Sadlerochit River                 | $Y = -48.7 + 139.2x - 100.6x^2 + 47.0x^3$    | 0.998          |
| Sadlerochit Spring Creek          | $Y = 19.8 + 14.1x$                           | 0.949          |
| Sikrelurak River                  | $Y = 582.9 - 578.3x + 143.4x^2$              | 0.997          |
| Tamayariak River                  | $Y = -206.1 + 529.2x - 459.9x^2 + 166.6x^3$  | 0.999          |
| Lower West Fork, Tamayariak River | $Y = -60.3 + 140.6x - 118.1x^2 + 41.8x^3$    | 0.999          |
| Middle Fork, Tamayariak River     | $Y = -86.1 + 173.3x - 117.6x^2 + 26.8x^3$    | 0.991          |
| Upper West Fork, Tamayariak River | $Y = -1768.2 + 1727.1x - 564.0x^2 + 61.7x^3$ | 0.997          |

## Tamayariak River

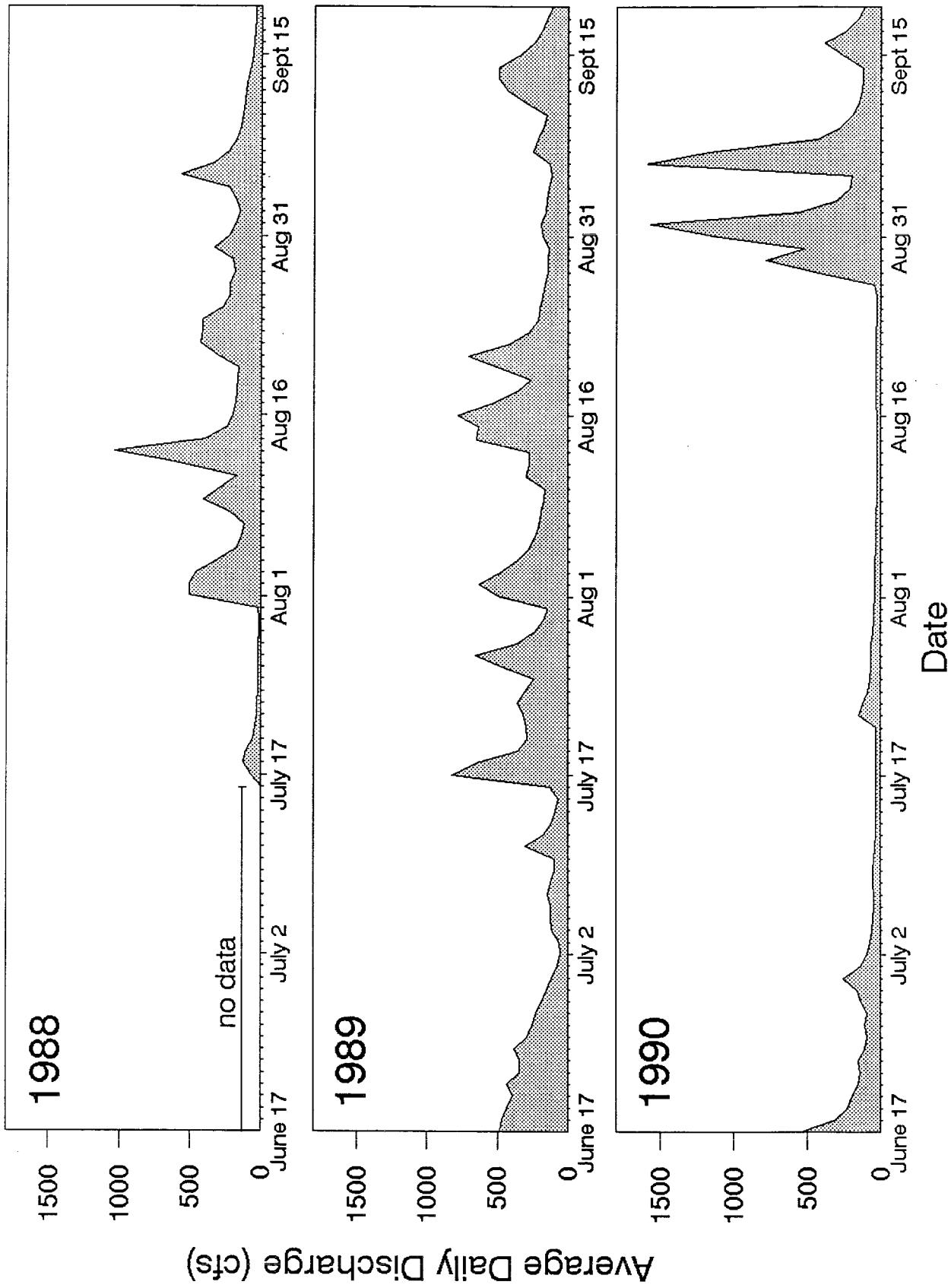


Figure 2.-Comparison of discharge records for the Tamayariak River for the three years of record, 1988-1990.

## Sadlerochit Springs

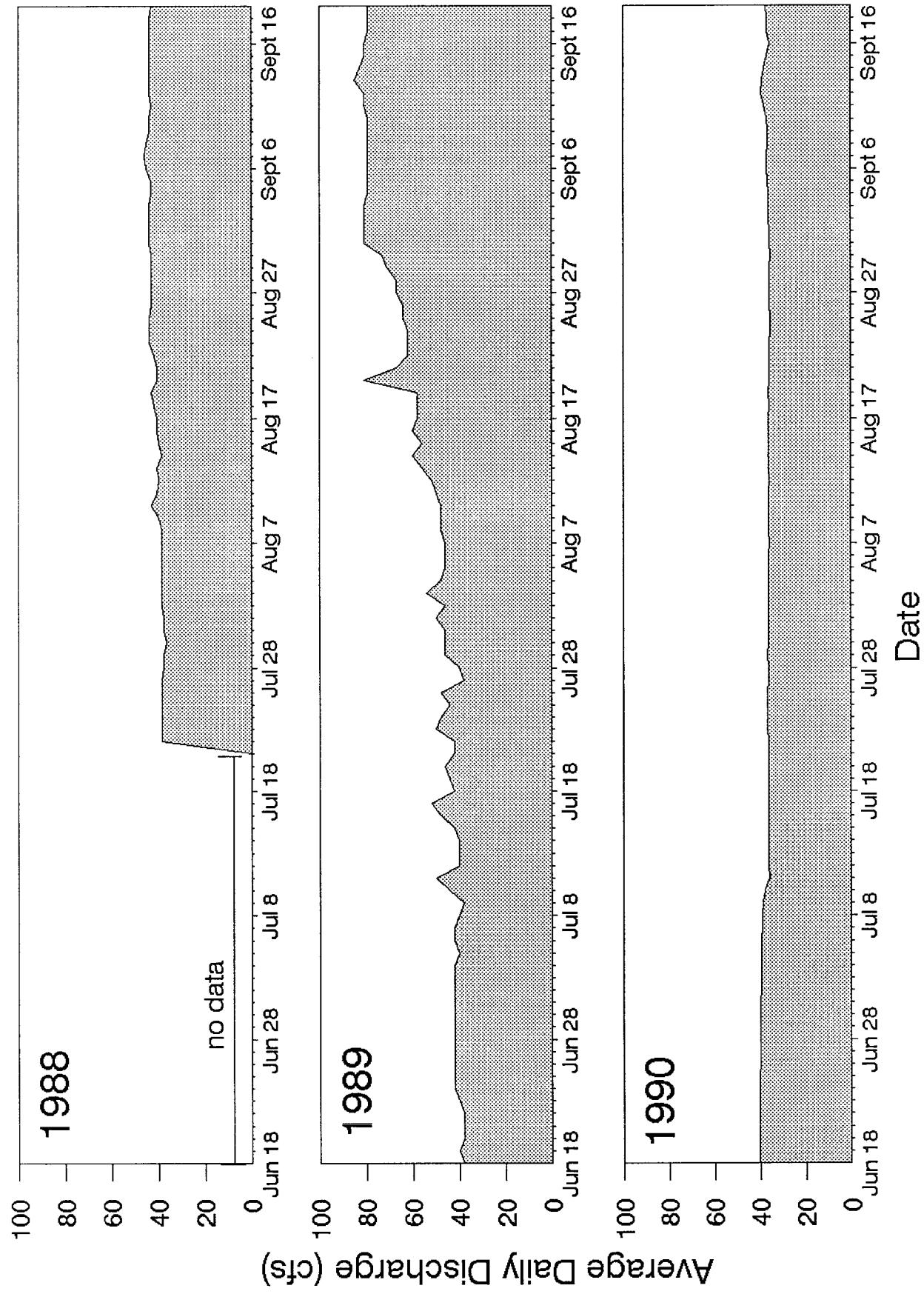


Figure 3.—Comparison of discharge records for Sadlerochit Springs for the three years of record, 1988–1990.

Upper West Fork Tamayariak River. These extremely low flows persisted through July and most of August. Approximately half the total discharge for the entire year came at the end of August and during September when the first significant precipitation events occurred.

Water temperature measurements taken from the eight gaging stations equipped with temperature thermistors are given in Appendix B. The Niguanak River and the mainstem of the Tamayariak River gaging stations were not equipped to collect temperature data. The daily average water temperature as well as the maximum and minimum temperatures and the time of each are provided.

Equipment malfunction, and destruction or movement of pressure transducers, temperature thermistors, and field recorders by wildlife were the causes of data gaps at several stream gaging stations throughout the gaging period (Table 3). A brown bear damaged the gaging equipment at the Niguanak River gaging station on July 9th. Several attempts to repair the field recorder failed. Data collection was discontinued at this gaging station and the field recorder was returned to the manufacturer for repair. The temperature thermistor for Sadlerochit Springs began malfunctioning on September 11. The problem was not evident until the data was down loaded from the field recorder. Nine days of temperature data were lost from the Sadlerochit Springs Creek gaging station.

Table 3.-Summary of missing 1990 stream discharge and temperature data.

| Gaging Station                   | No. Days | Dates of Missing Data | Remarks  |
|----------------------------------|----------|-----------------------|--|
| Lower West Fork Tamayariak River | 26       | 6/14-7/9              | Cable connecting pressure and temperature probes to field recorder was chewed in half.               |
| Middle Fork Tamayariak River     | 3        | 6/21-6/23             | Bear ripped cable out of the ground. Probes were reset.  |
| Niguanak River                   | 73       | 7/9-9/19              | Bear destroyed gaging station and field recorded. Equipment was returned to manufacturer for repair. |
| Sadlerochit River                | 16       | 9/4-9/19              | Field recorder stopped logging data.   |
| Sadlerochit Springs              | 9        | 9/11-9/19             | Temperature thermistor malfunctioned.  |
| Tamayariak River                 | 100      | 6/12-9/19             | Temperature thermistor was not installed. No temperature data was collected.                         |
| Niguanak River                   | 100      | 6/12-9/19             | Temperature thermistor was not installed. No temperature data was collected.                         |

In an effort to estimate missing data at the Niguanak River gaging station a comparison of the average daily discharge was conducted for the Niguanak and Sikrelurak Rivers. The Sikrelurak River is adjacent to the Niguanak and similar in drainage area. A strong linear relationship ( $R^2=0.91$ ) was established between the Sikrelurak and Niguanak Rivers. The relationship was based on average daily discharge records that the two streams had in common for 1989 and 1990. All estimated discharge records are reported in Appendix A. Regression analysis to estimate missing data was attempted but no relationships were found for the remaining missing discharge data.

#### Discussion

Fiscal year 1990 was the third year of a 5-year water resource inventory program (1988-1992) designed to quantify stream discharge rates, discharge frequency distribution, average monthly water yields, and flood frequencies and sizes within the 1002 area of the Arctic National Wildlife Refuge. Figures 2 and 3 clearly show the extreme variability in discharge data for the three years of record and illustrate the need of multi-years of discharge data before quantification of drainage basin characteristics can be made.

The 1990 water year is the driest year for the three years of record (Figure 2). Discharge in 1990 was approximately 50% of the 1989 discharge. Discharges of zero or less than one cfs were recorded on several streams during July and August. It should be noted that more than half of the 1990 water yield came in late August and September. The high flows late in the summer can be attributed to snow and rain events followed by warm air temperatures. If September is removed from the database, the 1990 average daily discharge per square mile is only 25 percent of 1989.

Precipitation records from gages located in the Arctic region indicate that precipitation for the 1990 water year ranged from 66% of the long term average at Sagwon to 83% of the long term average at Toolik River (Soil Conservation Service 1989 and unpublished). The 1990 precipitation records for Barter Island are incomplete. Discharge records from Sadlerochit Springs Creek, a deep groundwater spring, support the precipitation records for 1989 and 1990 (Figure 3). As reported by Lyons (1990) the steadily increased spring flow at Sadlerochit Springs suggested that the trend in 1989 was toward a wetter than normal year. In 1990 the steady decrease in flow from Sadlerochit Springs indicates a trend towards a relatively drier than normal year.

Due to the extreme conditions that exist prior to and during breakup, discharge measurements can not be taken until the river channel is free of anchor ice. This accounts for the poor documentation of discharge during the breakup period.

Estimates of missing data have been made where a strong relationship between two streams was found. As additional data is collected these

relationships should improve and missing discharge records may be estimated.

The closest river with a long record of discharge measurements is the Sagavanirktok River. The Sadlerochit and Tamayariak Rivers are the largest rivers with gaging stations in the 1002 area. A comparison of the average daily discharge of the Sadlerochit ( $R^2=0.48$ ) and Tamayariak ( $R^2=0.22$ ) Rivers to the Sagavanirktok River for 1988, 1989, and 1990 were unsuccessful. The Sagavanirktok River is a much larger drainage system than any within the 1002 area and a strong correlation was not expected.

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## **Appendix A**

### **Surface Water Discharge Records**

## ARCTIC NATIONAL WILDLIFE REFUGE

## Akutoktak River

LOCATION.--Lat 60°49'58", Long 143°46'50", in center sec. 36, T.6N., R.33E., 0.6 miles upstream from the confluence with the Okpilak River, 20.8 miles south-southwest of Kaktovik, Alaska.

DRAINAGE AREA.--97.1 mi<sup>2</sup>, of which 66.0 mi<sup>2</sup> is located within the Arctic National Wildlife Refuge Wilderness Area.

PERIOD OF RECORD.--July to Sept. 1988; June to Sept. 1989; June to Sept. 1990.

REMARKS.--This is a 4th Order drainage. Discharge records are initiated during break-up and discontinued at freeze-up of each year.

EXTREMES FOR PERIOD OF RECORD.--Maximum Discharge, 1,703 cfs Aug. 20, 1989 @ 2350 hrs; Minimum Discharge, 0.7 cfs Aug. 18, 1990 @ 0903 hrs.

## JUNE 1990

| DATE    | AVE.DAILY<br>DISCH.<br>CU.FT/SEC | TIME<br>OF MAX<br>DISCH. | MAX<br>DISCH.<br>CU FT/SEC | TIME<br>OF MIN<br>DISCH. | MIN<br>DISCH.<br>CU. FT/SEC |
|---------|----------------------------------|--------------------------|----------------------------|--------------------------|-----------------------------|
| 1       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 2       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 3       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 4       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 5       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 6       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 7       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 8       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 9       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 10      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 11      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 12      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 13      | 8.9                              | 2358                     | 10.8                       | 0858                     | 8.1                         |
| 14      | 10.8                             | 1718                     | 11.9                       | 0723                     | 9.8                         |
| 15      | 10.3                             | 2038                     | 12.4                       | 0938                     | 9.4                         |
| 16      | 9.4                              | 2203                     | 10.3                       | 1208                     | 8.9                         |
| 17      | 14.1                             | 2358                     | 39.4                       | 0518                     | 9.8                         |
| 18      | 47.7                             | 0958                     | 50.3                       | 0003                     | 39.4                        |
| 19      | 44.0                             | 0008                     | 46.5                       | 2358                     | 41.7                        |
| 20      | 133.9                            | 0733                     | 215.2                      | 0438                     | 38.3                        |
| 21      | 117.8                            | 0813                     | 129.2                      | 2353                     | 101.0                       |
| 22      | 99.0                             | 0943                     | 107.1                      | 2358                     | 87.6                        |
| 23      | 64.3                             | 0003                     | 87.6                       | 2358                     | 50.3                        |
| 24      | 46.5                             | 0003                     | 50.3                       | 2353                     | 42.9                        |
| 25      | 35.1                             | 0003                     | 42.9                       | 2358                     | 27.4                        |
| 26      | 22.4                             | 0003                     | 27.4                       | 2353                     | 17.3                        |
| 27      | 15.3                             | 0013                     | 18.0                       | 2353                     | 13.0                        |
| 28      | 11.3                             | 0003                     | 13.0                       | 2348                     | 9.8                         |
| 29      | 8.5                              | 0013                     | 9.8                        | 2358                     | 7.6                         |
| 30      | 6.9                              | 0003                     | 7.6                        | 2353                     | 5.8                         |
| TOTAL   | 706.4                            | - - -                    | - - -                      | - - -                    | - - -                       |
| AVERAGE | 39.2                             |                          | 49.4                       |                          | 29.3                        |
| MAXIMUM | 133.9                            |                          | 215.2                      |                          | 101.0                       |
| MINIMUM | 6.9                              |                          | 7.6                        |                          | 5.8                         |
| ACRE FT | 1398.6                           | - - -                    | - - -                      | - - -                    | - - -                       |

## ARCTIC NATIONAL WILDLIFE REFUGE

Akutoktak River

JULY 1990

| DATE    | AVE.DAILY<br>DISCH.<br>CU.FT/SEC | TIME<br>OF MAX<br>DISCH. | MAX<br>DISCH.<br>CU FT/SEC | TIME<br>OF MIN<br>DISCH. | MIN<br>DISCH.<br>CU. FT/SEC |
|---------|----------------------------------|--------------------------|----------------------------|--------------------------|-----------------------------|
| 1       | 5.8                              | 1808                     | 6.1                        | 1128                     | 5.4                         |
| 2       | 5.1                              | 1433                     | 5.8                        | 2353                     | 4.5                         |
| 3       | 4.2                              | 0008                     | 4.5                        | 2348                     | 3.4                         |
| 4       | 3.0                              | 0008                     | 3.4                        | 2353                     | 2.8                         |
| 5       | 2.4                              | 0008                     | 2.8                        | 2358                     | 2.0                         |
| 6       | 1.7                              | 0003                     | 2.0                        | 2353                     | 1.6                         |
| 7       | 1.4                              | 0033                     | 1.6                        | 2018                     | 1.2                         |
| 8       | 1.4                              | 1743                     | 1.6                        | 0003                     | 1.3                         |
| 9       | 1.6                              | 2023                     | 1.8                        | 0203                     | 1.6                         |
| 10      | 1.8                              | 2353                     | 2.2                        | 0248                     | 1.7                         |
| 11      | 2.4                              | 1733                     | 2.4                        | 0003                     | 2.2                         |
| 12      | 2.4                              | 1628                     | 2.8                        | 0328                     | 2.0                         |
| 13      | 2.2                              | 0043                     | 2.6                        | 2358                     | 1.8                         |
| 14      | 1.7                              | 0003                     | 1.8                        | 2353                     | 1.6                         |
| 15      | 1.4                              | 0018                     | 1.6                        | 2358                     | 1.3                         |
| 16      | 1.1                              | 0023                     | 1.3                        | 1508                     | 1.1                         |
| 17      | 1.6                              | 2208                     | 1.8                        | 0003                     | 1.2                         |
| 18      | 1.7                              | 1908                     | 1.8                        | 0508                     | 1.7                         |
| 19      | 1.6                              | 0153                     | 1.7                        | 2208                     | 1.6                         |
| 20      | 1.6                              | 0123                     | 1.6                        | 1548                     | 1.4                         |
| 21      | 1.4                              | 2358                     | 1.8                        | 1513                     | 1.3                         |
| 22      | 3.2                              | 1748                     | 4.2                        | 0003                     | 1.8                         |
| 23      | 2.8                              | 0003                     | 3.9                        | 2358                     | 2.0                         |
| 24      | 1.6                              | 0008                     | 2.0                        | 2348                     | 1.3                         |
| 25      | 1.3                              | 0003                     | 1.4                        | 2358                     | 1.1                         |
| 26      | 1.1                              | 0908                     | 1.2                        | 0348                     | 1.1                         |
| 27      | 1.0                              | 0003                     | 1.1                        | 2058                     | 1.0                         |
| 28      | 4.5                              | 1648                     | 10.3                       | 0003                     | 1.0                         |
| 29      | 8.1                              | 0013                     | 9.4                        | 2353                     | 6.5                         |
| 30      | 5.4                              | 0003                     | 6.5                        | 2353                     | 4.5                         |
| 31      | 3.9                              | 0003                     | 4.5                        | 2358                     | 3.4                         |
| TOTAL   | 80.2                             | - - -                    | - - -                      | - - -                    | - - -                       |
| AVERAGE | 2.6                              | 3.1                      |                            | 2.1                      |                             |
| MAXIMUM | 8.1                              | 10.3                     |                            | 6.5                      |                             |
| MINIMUM | 1.0                              | 1.1                      |                            | 1.0                      |                             |
| ACRE FT | 158.7                            | - - -                    | - - -                      | - - -                    | - - -                       |

## ARCTIC NATIONAL WILDLIFE REFUGE

## Akutoktak River

AUGUST 1990

| DATE    | AVE.DAILY<br>DISCH.<br>CU.FT/SEC | TIME<br>OF MAX<br>DISCH. | MAX<br>DISCH.<br>CU FT/SEC | TIME<br>OF MIN<br>DISCH. | MIN<br>DISCH.<br>CU. FT/SEC |
|---------|----------------------------------|--------------------------|----------------------------|--------------------------|-----------------------------|
| 1       | 3.0                              | 0003                     | 3.4                        | 2353                     | 2.6                         |
| 2       | 2.4                              | 0013                     | 2.8                        | 2358                     | 2.0                         |
| 3       | 1.8                              | 0003                     | 2.0                        | 2223                     | 1.7                         |
| 4       | 1.7                              | 0018                     | 1.8                        | 2348                     | 1.6                         |
| 5       | 1.6                              | 1708                     | 1.7                        | 2348                     | 1.4                         |
| 6       | 1.4                              | 1723                     | 1.7                        | 0238                     | 1.3                         |
| 7       | 1.7                              | 1913                     | 2.0                        | 0018                     | 1.6                         |
| 8       | 1.6                              | 0013                     | 1.7                        | 2353                     | 1.4                         |
| 9       | 1.3                              | 0018                     | 1.4                        | 2333                     | 1.3                         |
| 10      | 1.2                              | 1903                     | 1.3                        | 2358                     | 1.2                         |
| 11      | 1.1                              | 0003                     | 1.2                        | 2348                     | 1.1                         |
| 12      | 1.0                              | 0003                     | 1.1                        | 2338                     | 1.0                         |
| 13      | 1.0                              | 1738                     | 1.1                        | 2313                     | 0.9                         |
| 14      | 0.9                              | 1843                     | 1.0                        | 2358                     | 0.9                         |
| 15      | 0.9                              | 1833                     | 1.0                        | 2328                     | 0.8                         |
| 16      | 0.8                              | 0008                     | 0.9                        | 2258                     | 0.8                         |
| 17      | 0.8                              | 1753                     | 0.9                        | 2353                     | 0.8                         |
| 18      | 1.2                              | 2358                     | 5.1                        | 0903                     | 0.7                         |
| 19      | 5.1                              | 1303                     | 5.4                        | 2343                     | 4.8                         |
| 20      | 4.5                              | 2343                     | 4.8                        | 1543                     | 4.5                         |
| 21      | 4.8                              | 1738                     | 5.1                        | 0008                     | 4.8                         |
| 22      | 4.8                              | 1603                     | 5.1                        | 0123                     | 4.8                         |
| 23      | 4.8                              | 0413                     | 4.8                        | 2243                     | 4.5                         |
| 24      | 3.9                              | 0003                     | 4.5                        | 2358                     | 3.2                         |
| 25      | 3.0                              | 0003                     | 3.2                        | 2353                     | 2.6                         |
| 26      | 2.4                              | 0038                     | 2.6                        | 2343                     | 2.2                         |
| 27      | 2.0                              | 0038                     | 2.2                        | 1448                     | 1.8                         |
| 28      | 2.4                              | 2343                     | 4.8                        | 1743                     | 2.0                         |
| 29      | 9.4                              | 1753                     | 11.9                       | 0003                     | 5.1                         |
| 30      | 10.3                             | 0008                     | 10.8                       | 1243                     | 9.8                         |
| 31      | 11.3                             | 2358                     | 14.7                       | 0913                     | 10.8                        |
| TOTAL   | 94.1                             | - - -                    | - - -                      | - - -                    | - - -                       |
| AVERAGE | 3.0                              | 3.6                      |                            |                          | 2.7                         |
| MAXIMUM | 11.3                             | 14.7                     |                            |                          | 10.8                        |
| MINIMUM | 0.8                              | 0.9                      |                            |                          | 0.7                         |
| ACRE FT | 186.2                            | - - -                    | - - -                      | - - -                    | - - -                       |

## ARCTIC NATIONAL WILDLIFE REFUGE

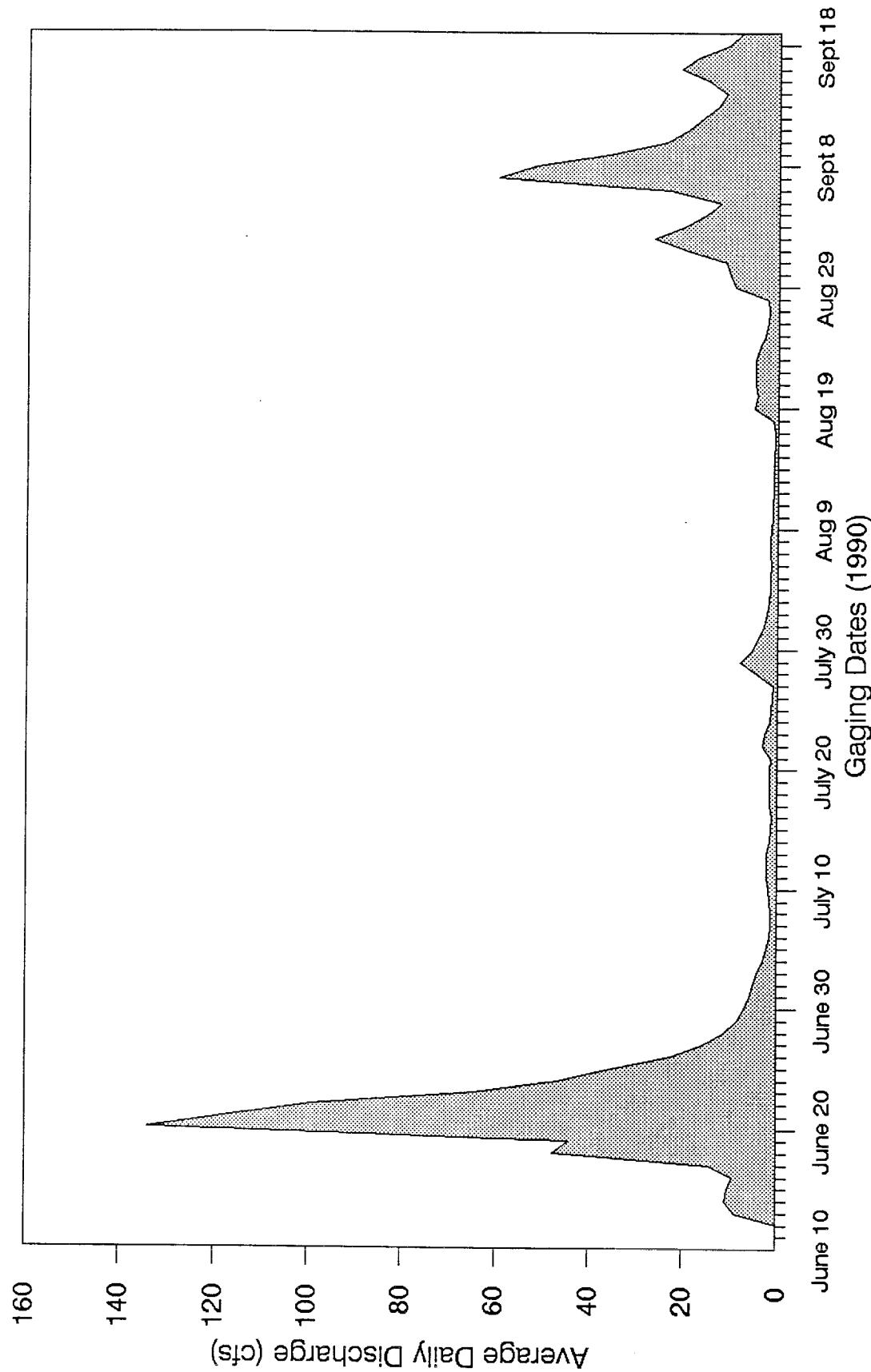
Akutoktak River

SEPTEMBER 1990

| DATE    | AVE.DAILY<br>DISCH.<br>CU.FT/SEC | TIME<br>OF MAX<br>DISCH. | MAX<br>DISCH.<br>CU FT/SEC | TIME<br>OF MIN<br>DISCH. | MIN<br>DISCH.<br>CU. FT/SEC |
|---------|----------------------------------|--------------------------|----------------------------|--------------------------|-----------------------------|
| 1       | 19.4                             | 2353                     | 29.2                       | 0003                     | 15.3                        |
| 2       | 26.5                             | 0008                     | 30.2                       | 2358                     | 23.2                        |
| 3       | 20.1                             | 0003                     | 23.2                       | 2358                     | 16.6                        |
| 4       | 15.3                             | 0003                     | 16.6                       | 0548                     | 13.0                        |
| 5       | 12.4                             | 0003                     | 14.1                       | 0958                     | 10.8                        |
| 6       | 23.2                             | 2353                     | 44.0                       | 0033                     | 12.4                        |
| 7       | 59.8                             | 1108                     | 70.5                       | 0003                     | 44.0                        |
| 8       | 51.6                             | 0313                     | 61.3                       | 2243                     | 41.7                        |
| 9       | 36.2                             | 0048                     | 42.9                       | 2238                     | 29.2                        |
| 10      | 24.0                             | 0058                     | 30.2                       | 2353                     | 18.0                        |
| 11      | 19.4                             | 0838                     | 24.0                       | 2353                     | 14.1                        |
| 12      | 16.0                             | 1018                     | 19.4                       | 0213                     | 13.5                        |
| 13      | 13.0                             | 0003                     | 14.1                       | 2358                     | 11.9                        |
| 14      | 11.3                             | 2358                     | 13.0                       | 1033                     | 9.4                         |
| 15      | 14.7                             | 2358                     | 18.7                       | 0003                     | 13.0                        |
| 16      | 20.8                             | 1723                     | 24.0                       | 0008                     | 18.7                        |
| 17      | 17.3                             | 0003                     | 20.1                       | 2358                     | 13.0                        |
| 18      | 10.8                             | 1553                     | 13.5                       | 1028                     | 8.5                         |
| 19      | 8.1                              | 0003                     | 9.4                        | 2343                     | 6.9                         |
| 20      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 21      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 22      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 23      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 24      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 25      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 26      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 27      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 28      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 29      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 30      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| TOTAL   | 419.9                            | - - -                    | - - -                      | - - -                    | - - -                       |
| AVERAGE | 22.1                             |                          | 27.3                       |                          | 17.5                        |
| MAXIMUM | 59.8                             |                          | 70.5                       |                          | 44.0                        |
| MINIMUM | 8.1                              |                          | 9.4                        |                          | 6.9                         |
| ACRE FT | 831.4                            |                          | - - -                      |                          | - - -                       |

Akutotak River  
1990

A-5



## ARCTIC NATIONAL WILDLIFE REFUGE

## Itkilyariak Creek, West Fork

LOCATION.--Lat 69°50'19", long 144°24'43", NE 1/4 NW 1/4 NW 1/4 sec. 33, T.6N., R.31E., 0.6 miles upstream from the confluence with the Itkilyariak Creek, 20.75 miles south-southwest of Kaktovik, Alaska.

DRAINAGE AREA.--26.9 mi<sup>2</sup>, of which 8.7 mi<sup>2</sup> is located within the Arctic National Wildlife Refuge Wilderness Area.

PERIOD OF RECORD.--June to Sept. 1989; June to Sept. 1990.

REMARKS.--This is a 3rd Order drainage. Discharge records are initiated during break-up and discontinued at freeze-up of each year.

EXTREMES FOR PERIOD OF RECORD.--Maximum Discharge, 1,419 cfs Aug. 20, 1989 @ 1825 hrs; Minimum Discharge, 0 cfs July 2-6, 1989, and July 13-16, 1990.

## JUNE 1990

| DATE    | AVE.DAILY<br>DISCH.<br>CU.FT/SEC | TIME<br>OF MAX<br>DISCH. | MAX<br>DISCH.<br>CU FT/SEC | TIME<br>OF MIN<br>DISCH. | MIN<br>DISCH.<br>CU. FT/SEC |
|---------|----------------------------------|--------------------------|----------------------------|--------------------------|-----------------------------|
| 1       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 2       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 3       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 4       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 5       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 6       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 7       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 8       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 9       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 10      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 11      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 12      | 43.0                             | 2344                     | 112.6                      | 0009                     | 25.3                        |
| 13      | 80.6                             | 0054                     | 127.2                      | 1144                     | 56.1                        |
| 14      | 47.1                             | 0004                     | 78.6                       | 1624                     | 34.1                        |
| 15      | 28.5                             | 0034                     | 43.0                       | 1909                     | 22.4                        |
| 16      | 31.8                             | 0334                     | 48.6                       | 0004                     | 22.4                        |
| 17      | 26.4                             | 1954                     | 36.5                       | 0619                     | 20.6                        |
| 18      | 29.5                             | 2359                     | 59.3                       | 1624                     | 24.3                        |
| 19      | 66.0                             | 2349                     | 159.6                      | 1249                     | 45.7                        |
| 20      | 88.5                             | 0054                     | 156.8                      | 2354                     | 53.0                        |
| 21      | 44.3                             | 0114                     | 57.7                       | 1624                     | 37.8                        |
| 22      | 53.0                             | 0249                     | 73.0                       | 2359                     | 37.8                        |
| 23      | 29.5                             | 0004                     | 39.0                       | 2359                     | 23.4                        |
| 24      | 19.7                             | 0009                     | 23.4                       | 2349                     | 15.6                        |
| 25      | 12.0                             | 0004                     | 15.6                       | 2354                     | 10.1                        |
| 26      | 7.8                              | 0009                     | 10.1                       | 2359                     | 7.3                         |
| 27      | 6.8                              | 0004                     | 7.3                        | 0724                     | 6.3                         |
| 28      | 5.8                              | 0004                     | 6.8                        | 2344                     | 5.4                         |
| 29      | 4.9                              | 0004                     | 5.4                        | 1739                     | 4.5                         |
| 30      | 5.4                              | 1734                     | 5.8                        | 0029                     | 4.9                         |
| TOTAL   | 630.4                            | - - -                    | - - -                      | - - -                    | - - -                       |
| AVERAGE | 33.2                             |                          | 56.1                       |                          | 24.0                        |
| MAXIMUM | 88.5                             |                          | 159.6                      |                          | 56.1                        |
| MINIMUM | 4.9                              |                          | 5.4                        |                          | 4.5                         |
| ACRE FT | 1248.2                           | - - -                    | - - -                      | - - -                    | - - -                       |

ARCTIC NATIONAL WILDLIFE REFUGE  
Itkilyariak Creek, West Fork

JULY 1990

| DATE    | AVE.DAILY<br>DISCH.<br>CU.FT/SEC | TIME<br>OF MAX<br>DISCH. | MAX<br>DISCH.<br>CU FT/SEC | TIME<br>OF MIN<br>DISCH. | MIN<br>DISCH.<br>CU. FT/SEC |
|---------|----------------------------------|--------------------------|----------------------------|--------------------------|-----------------------------|
| 1       | 4.5                              | 0004                     | 5.4                        | 2359                     | 4.1                         |
| 2       | 3.4                              | 0009                     | 4.1                        | 1619                     | 3.4                         |
| 3       | 3.0                              | 2124                     | 3.7                        | 1414                     | 2.7                         |
| 4       | 2.7                              | 0004                     | 3.7                        | 2334                     | 2.4                         |
| 5       | 2.1                              | 0004                     | 2.4                        | 2354                     | 1.6                         |
| 6       | 1.4                              | 0004                     | 1.6                        | 2029                     | 1.2                         |
| 7       | 1.4                              | 1714                     | 1.6                        | 1314                     | 1.2                         |
| 8       | 1.9                              | 2309                     | 2.7                        | 0059                     | 1.4                         |
| 9       | 2.1                              | 0014                     | 2.7                        | 2354                     | 1.6                         |
| 10      | 1.6                              | 0024                     | 1.9                        | 2354                     | 1.4                         |
| 11      | 1.0                              | 0034                     | 1.4                        | 2354                     | 0.8                         |
| 12      | 0.5                              | 0009                     | 0.8                        | 2344                     | 0.3                         |
| 13      | 0.1                              | 0009                     | 0.3                        | 2359                     | 0.0                         |
| 14      | 0.0                              | 2224                     | 0.1                        | 0644                     | 0.0                         |
| 15      | 0.1                              | 1149                     | 0.1                        | 2334                     | 0.0                         |
| 16      | 1.0                              | 1449                     | 1.4                        | 0004                     | 0.0                         |
| 17      | 1.2                              | 2154                     | 1.4                        | 0304                     | 0.8                         |
| 18      | 1.4                              | 1714                     | 1.9                        | 0514                     | 1.2                         |
| 19      | 1.4                              | 0004                     | 1.6                        | 2359                     | 1.0                         |
| 20      | 0.6                              | 0004                     | 1.0                        | 2359                     | 0.5                         |
| 21      | 0.8                              | 2359                     | 4.1                        | 0719                     | 0.3                         |
| 22      | 20.6                             | 1144                     | 47.1                       | 0004                     | 4.5                         |
| 23      | 25.3                             | 0019                     | 29.5                       | 2354                     | 20.6                        |
| 24      | 15.6                             | 0009                     | 19.7                       | 2354                     | 11.3                        |
| 25      | 9.5                              | 0004                     | 11.3                       | 2049                     | 8.9                         |
| 26      | 48.6                             | 1849                     | 115.0                      | 0009                     | 10.1                        |
| 27      | 41.6                             | 0009                     | 82.5                       | 2344                     | 23.4                        |
| 28      | 16.4                             | 0014                     | 23.4                       | 2344                     | 12.7                        |
| 29      | 11.3                             | 0014                     | 12.7                       | 2359                     | 10.1                        |
| 30      | 8.9                              | 0004                     | 10.1                       | 2339                     | 7.8                         |
| 31      | 6.8                              | 0004                     | 7.8                        | 2359                     | 5.8                         |
| TOTAL   | 236.6                            |                          | - - -                      | - - -                    | - - -                       |
| AVERAGE | 7.6                              |                          | 13.0                       |                          | 4.5                         |
| MAXIMUM | 48.6                             |                          | 115.0                      |                          | 23.4                        |
| MINIMUM | 0.0                              |                          | 0.1                        |                          | 0.0                         |
| ACRE FT | 468.4                            |                          | - - -                      | - - -                    | - - -                       |

## ARCTIC NATIONAL WILDLIFE REFUGE

Itkilyariak Creek, West Fork

AUGUST 1990

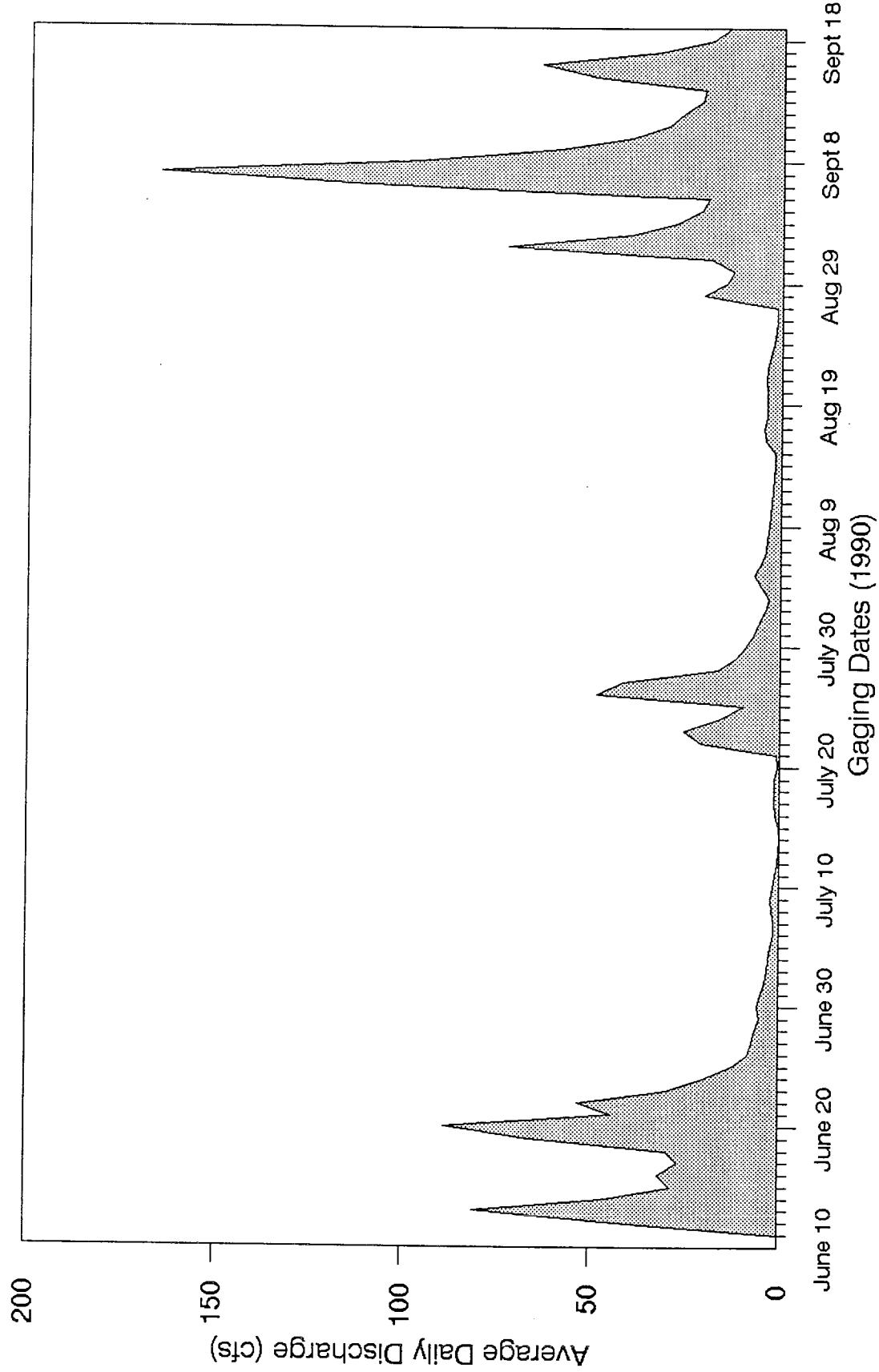
| DATE    | AVE.DAILY<br>DISCH.<br>CU.FT/SEC | TIME<br>OF MAX<br>DISCH. | MAX<br>DISCH.<br>CU FT/SEC | TIME<br>OF MIN<br>DISCH. | MIN<br>DISCH.<br>CU. FT/SEC |
|---------|----------------------------------|--------------------------|----------------------------|--------------------------|-----------------------------|
| 1       | 5.4                              | 0004                     | 5.8                        | 2359                     | 4.5                         |
| 2       | 3.7                              | 0029                     | 4.5                        | 2354                     | 3.0                         |
| 3       | 3.0                              | 1429                     | 3.0                        | 0624                     | 2.7                         |
| 4       | 4.9                              | 1914                     | 8.3                        | 0004                     | 2.7                         |
| 5       | 6.8                              | 0119                     | 7.8                        | 2344                     | 5.4                         |
| 6       | 4.9                              | 0009                     | 5.8                        | 2344                     | 3.7                         |
| 7       | 3.7                              | 0009                     | 4.1                        | 2354                     | 3.4                         |
| 8       | 3.4                              | 1649                     | 3.4                        | 0619                     | 3.0                         |
| 9       | 3.0                              | 1219                     | 3.4                        | 2359                     | 3.0                         |
| 10      | 2.7                              | 0004                     | 3.0                        | 2349                     | 2.7                         |
| 11      | 2.4                              | 1534                     | 2.7                        | 2349                     | 2.4                         |
| 12      | 2.1                              | 1539                     | 2.4                        | 2359                     | 1.9                         |
| 13      | 1.9                              | 1529                     | 2.1                        | 2344                     | 1.6                         |
| 14      | 1.6                              | 1524                     | 1.9                        | 2244                     | 1.4                         |
| 15      | 1.6                              | 1749                     | 1.9                        | 0629                     | 1.4                         |
| 16      | 4.1                              | 1524                     | 4.9                        | 0029                     | 1.6                         |
| 17      | 4.5                              | 1519                     | 4.9                        | 2339                     | 4.1                         |
| 18      | 3.7                              | 0004                     | 4.1                        | 2324                     | 3.7                         |
| 19      | 3.7                              | 1454                     | 4.5                        | 2359                     | 3.7                         |
| 20      | 3.7                              | 1719                     | 4.1                        | 0344                     | 3.7                         |
| 21      | 4.1                              | 1829                     | 4.9                        | 0744                     | 3.7                         |
| 22      | 3.7                              | 0009                     | 4.1                        | 2359                     | 3.4                         |
| 23      | 3.0                              | 0009                     | 3.4                        | 2319                     | 2.4                         |
| 24      | 2.1                              | 0054                     | 2.4                        | 2319                     | 1.9                         |
| 25      | 1.6                              | 0029                     | 1.9                        | 2349                     | 1.2                         |
| 26      | 1.2                              | 1434                     | 1.4                        | 2324                     | 1.2                         |
| 27      | 1.4                              | 2359                     | 10.1                       | 0809                     | 1.0                         |
| 28      | 20.6                             | 1159                     | 28.5                       | 0004                     | 10.1                        |
| 29      | 14.8                             | 0009                     | 20.6                       | 2349                     | 12.0                        |
| 30      | 12.7                             | 1529                     | 13.4                       | 0534                     | 11.3                        |
| 31      | 18.8                             | 2354                     | 26.4                       | 0014                     | 12.7                        |
| TOTAL   | 155.3                            | - - -                    | - - -                      | - - -                    | - - -                       |
| AVERAGE | 5.0                              | 6.4                      |                            |                          | 3.9                         |
| MAXIMUM | 20.6                             | 28.5                     |                            |                          | 12.7                        |
| MINIMUM | 1.2                              | 1.4                      |                            |                          | 1.0                         |
| ACRE FT | 307.5                            | - - -                    | - - -                      | - - -                    | - - -                       |

ARCTIC NATIONAL WILDLIFE REFUGE  
Itkilyariak Creek, West Fork

SEPTEMBER 1990

| DATE      | AVE.DAILY<br>DISCH.<br>CU.FT/SEC | TIME<br>OF MAX<br>DISCH. | MAX<br>DISCH.<br>CU FT/SEC | TIME<br>OF MIN<br>DISCH. | MIN<br>DISCH.<br>CU. FT/SEC |
|-----------|----------------------------------|--------------------------|----------------------------|--------------------------|-----------------------------|
| 1         | 73.0                             | 0314                     | 112.6                      | 0004                     | 26.4                        |
| 2         | 40.3                             | 0039                     | 53.0                       | 2334                     | 34.1                        |
| 3         | 28.5                             | 0019                     | 35.3                       | 1139                     | 21.5                        |
| 4         | 21.5                             | 0029                     | 27.4                       | 1449                     | 18.0                        |
| 5         | 19.7                             | 2359                     | 22.4                       | 0629                     | 18.0                        |
| 6         | 110.3                            | 2134                     | 288.6                      | 0019                     | 21.5                        |
| 7         | 165.5                            | 0019                     | 268.4                      | 2159                     | 124.7                       |
| 8         | 96.9                             | 0339                     | 134.9                      | 2359                     | 76.8                        |
| 9         | 59.3                             | 0009                     | 78.6                       | 2359                     | 50.0                        |
| 10        | 40.3                             | 1844                     | 57.7                       | 0839                     | 27.4                        |
| 11        | 30.6                             | 0004                     | 44.3                       | 0929                     | 20.6                        |
| 12        | 26.4                             | 0004                     | 36.5                       | 0934                     | 21.5                        |
| 13        | 21.5                             | 0009                     | 25.3                       | 0854                     | 18.8                        |
| 14        | 20.6                             | 0004                     | 21.5                       | 0849                     | 19.7                        |
| 15        | 50.0                             | 2319                     | 96.9                       | 0024                     | 20.6                        |
| 16        | 64.2                             | 0054                     | 96.9                       | 2239                     | 47.1                        |
| 17        | 32.9                             | 0014                     | 48.6                       | 1339                     | 22.4                        |
| 18        | 18.8                             | 0004                     | 30.6                       | 1114                     | 14.8                        |
| 19        | 14.1                             | 0009                     | 19.7                       | 1839                     | 11.3                        |
| 20        | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 21        | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 22        | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 23        | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 24        | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 25        | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 26        | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 27        | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 28        | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 29        | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 30        | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| TOTAL     | 934.4                            | - - -                    | - - -                      | - - -                    | - - -                       |
| AVERAGE   | 49.2                             |                          | 78.9                       |                          | 32.4                        |
| MAXIMUM   | 165.5                            |                          | 288.6                      |                          | 124.7                       |
| MINIMUM   | 14.1                             |                          | 19.7                       |                          | 11.3                        |
| 0 ACRE FT | 1850.2                           | - - -                    | - - -                      | - - -                    | - - -                       |

West Fork Itkilyariak Creek  
1990



## ARCTIC NATIONAL WILDLIFE REFUGE

## Niguanak River

LOCATION.--Lat 70°0'35", Long 143°1'54", NWNWNE sec. 36, T.8N., R.36E., 6 miles upstream from the mouth, 16.5 mi south-east of Kaktovik, Alaska.

DRAINAGE AREA.--136.2 mi<sup>2</sup>.

PERIOD OF RECORD.--June to Sept. 1989; June to Sept. 1990

REMARKS.--This is a 5th Order drainage. Discharge records are initiated during break-up and discontinued at freeze-up of each year. Bear disturbed instrument July 13, 1990.

EXTREMES FOR PERIOD OF RECORD.--Maximum Discharge, 2,071 cfs Aug. 21, 1989 @ 0310 hrs; Minimum Discharge, 3.0 cfs July 8, 1990.

## JUNE 1990

| DATE    | AVE.DAILY<br>DISCH.<br>CU.FT/SEC | TIME<br>OF MAX<br>DISCH. | MAX<br>DISCH.<br>CU FT/SEC | TIME<br>OF MIN<br>DISCH. | MIN<br>DISCH.<br>CU. FT/SEC |
|---------|----------------------------------|--------------------------|----------------------------|--------------------------|-----------------------------|
| 1       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 2       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 3       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 4       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 5       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 6       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 7       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 8       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 9       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 10      | 71                               | 2351                     | 92                         | 0001                     | 58                          |
| 11      | 87                               | 0556                     | 102                        | 2356                     | 75                          |
| 12      | 78                               | 2356                     | 121                        | 1041                     | 66                          |
| 13      | 135                              | 0551                     | 156                        | 1651                     | 112                         |
| 14      | 138                              | 0351                     | 168                        | 1641                     | 110                         |
| 15      | 138                              | 0441                     | 171                        | 1606                     | 110                         |
| 16      | 107                              | 0311                     | 143                        | 1826                     | 82                          |
| 17      | 92                               | 0501                     | 99                         | 1756                     | 85                          |
| 18      | 94                               | 0611                     | 107                        | 1756                     | 85                          |
| 19      | 89                               | 0346                     | 104                        | 1616                     | 80                          |
| 20      | 92                               | 2356                     | 110                        | 1341                     | 80                          |
| 21      | 92                               | 0206                     | 115                        | 1621                     | 75                          |
| 22      | 94                               | 0411                     | 112                        | 1526                     | 80                          |
| 23      | 94                               | 0331                     | 118                        | 1941                     | 78                          |
| 24      | 64                               | 0106                     | 85                         | 1901                     | 52                          |
| 25      | 52                               | 0626                     | 58                         | 1756                     | 44                          |
| 26      | 48                               | 0636                     | 58                         | 2216                     | 37                          |
| 27      | 34                               | 0001                     | 39                         | 2021                     | 29                          |
| 28      | 34                               | 1021                     | 37                         | 1741                     | 27                          |
| 29      | 32                               | 0956                     | 35                         | 2111                     | 29                          |
| 30      | 26                               | 0326                     | 30                         | 2101                     | 20                          |
| TOTAL   | 1689                             | - - -                    | - - -                      | - - -                    | - - -                       |
| AVERAGE | 80                               |                          | 98                         |                          | 67                          |
| MAXIMUM | 138                              |                          | 171                        |                          | 112                         |
| MINIMUM | 26                               |                          | 30                         |                          | 20                          |
| ACRE FT | 3345                             | - - -                    | - - -                      | - - -                    | - - -                       |

## ARCTIC NATIONAL WILDLIFE REFUGE

Niguanak River

JULY 1990

| DATE    | AVE.DAILY<br>DISCH.<br>CU.FT/SEC | TIME<br>OF MAX<br>DISCH. | MAX<br>DISCH.<br>CU FT/SEC | TIME<br>OF MIN<br>DISCH. | MIN<br>DISCH.<br>CU. FT/SEC |
|---------|----------------------------------|--------------------------|----------------------------|--------------------------|-----------------------------|
| 1       | 21                               | 701                      | 22                         | 2131                     | 18                          |
| 2       | 17                               | 0901                     | 6                          | 2321                     | 4                           |
| 3       | 14                               | 1126                     | 11                         | 2251                     | 3                           |
| 4       | 13                               | 1651                     | 4                          | 0311                     | 3                           |
| 5       | 8 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 6       | 5 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 7       | 5 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 8       | 3 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 9       | 5 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 10      | 4 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 11      | 4 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 12      | 3 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 13      | 2 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 14      | 2 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 15      | 1 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 16      | 1 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 17      | 2 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 18      | 2 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 19      | 1 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 20      | 1 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 21      | 1 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 22      | 5 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 23      | 6 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 24      | 2 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 25      | 1 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 26      | 1 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 27      | 1 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 28      | 1 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 29      | 1 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 30      | 1 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 31      | 1 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| TOTAL   | 135                              | - - -                    | - - -                      | - - -                    | - - -                       |
| AVERAGE | 4                                | - - -                    | - - -                      | - - -                    | - - -                       |
| MAXIMUM | 21                               | - - -                    | - - -                      | - - -                    | - - -                       |
| MINIMUM | 1                                | - - -                    | - - -                      | - - -                    | - - -                       |
| ACRE FT | 278                              | - - -                    | - - -                      | - - -                    | - - -                       |

NOTE: e = estimated

## ARCTIC NATIONAL WILDLIFE REFUGE

Niguanak River

AUGUST 1990

| DATE    | AVE.DAILY<br>DISCH.<br>CU.FT/SEC | TIME<br>OF MAX<br>DISCH. | MAX<br>DISCH.<br>CU FT/SEC | TIME<br>OF MIN<br>DISCH. | MIN<br>DISCH.<br>CU. FT/SEC |
|---------|----------------------------------|--------------------------|----------------------------|--------------------------|-----------------------------|
| 1       | 1 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 2       | 0 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 3       | 1 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 4       | 1 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 5       | 1 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 6       | 1 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 7       | 0 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 8       | 1 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 9       | 1 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 10      | 0 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 11      | 0 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 12      | 0 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 13      | 0 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 14      | 0 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 15      | 0 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 16      | 0 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 17      | 0 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 18      | 0 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 19      | 0 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 20      | 0 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 21      | 0 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 22      | 0 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 23      | 0 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 24      | 0 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 25      | 0 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 26      | 0 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 27      | 0 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 28      | 1 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 29      | 1 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 30      | 1 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 31      | 3 e                              | - - -                    | - - -                      | - - -                    | - - -                       |
| TOTAL   | 16                               | - - -                    | - - -                      | - - -                    | - - -                       |
| AVERAGE | 1                                | - - -                    | - - -                      | - - -                    | - - -                       |
| MAXIMUM | 1                                | - - -                    | - - -                      | - - -                    | - - -                       |
| MINIMUM | 0                                | - - -                    | - - -                      | - - -                    | - - -                       |
| ACRE FT | 31                               | - - -                    | - - -                      | - - -                    | - - -                       |

NOTE: e = estimated

## ARCTIC NATIONAL WILDLIFE REFUGE

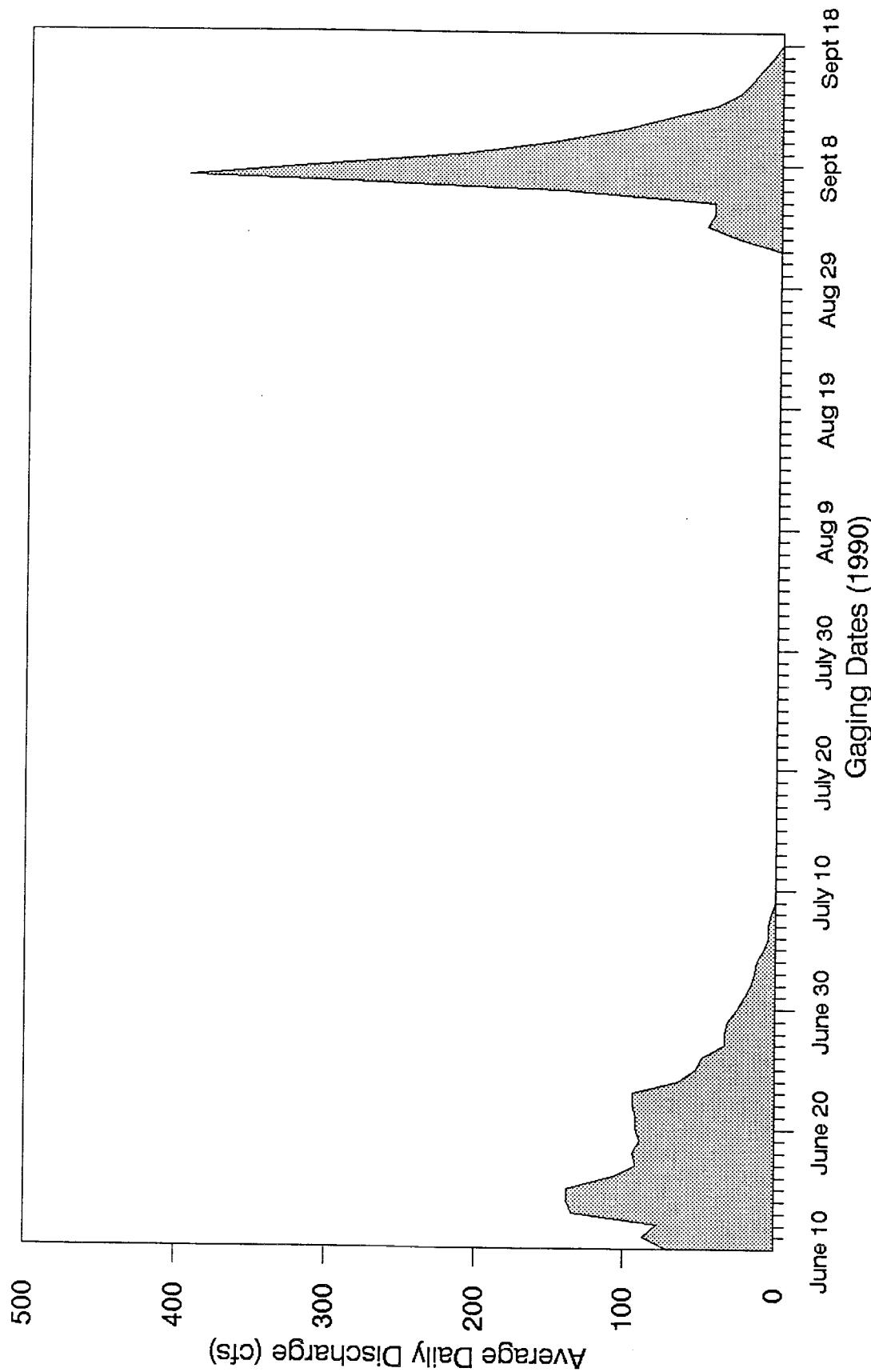
## Niguanak River

SEPTEMBER 1990

| DATE    | AVE.DAILY<br>DISCH.<br>CU.FT/SEC | TIME<br>OF MAX<br>DISCH. | MAX<br>DISCH.<br>CU FT/SEC | TIME<br>OF MIN<br>DISCH. | MIN<br>DISCH.<br>CU. FT/SEC |
|---------|----------------------------------|--------------------------|----------------------------|--------------------------|-----------------------------|
| 1       | 16 e                             | - - -                    | - - -                      | - - -                    | - - -                       |
| 2       | 29 e                             | - - -                    | - - -                      | - - -                    | - - -                       |
| 3       | 39 e                             | - - -                    | - - -                      | - - -                    | - - -                       |
| 4       | 37 e                             | - - -                    | - - -                      | - - -                    | - - -                       |
| 5       | 37 e                             | - - -                    | - - -                      | - - -                    | - - -                       |
| 6       | 84 e                             | - - -                    | - - -                      | - - -                    | - - -                       |
| 7       | 200 e                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 8       | 155 e                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 9       | 115 e                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 10      | 87 e                             | - - -                    | - - -                      | - - -                    | - - -                       |
| 11      | 66 e                             | - - -                    | - - -                      | - - -                    | - - -                       |
| 12      | 50 e                             | - - -                    | - - -                      | - - -                    | - - -                       |
| 13      | 37 e                             | - - -                    | - - -                      | - - -                    | - - -                       |
| 14      | 29 e                             | - - -                    | - - -                      | - - -                    | - - -                       |
| 15      | 25 e                             | - - -                    | - - -                      | - - -                    | - - -                       |
| 16      | 22 e                             | - - -                    | - - -                      | - - -                    | - - -                       |
| 17      | 19 e                             | - - -                    | - - -                      | - - -                    | - - -                       |
| 18      | 16 e                             | - - -                    | - - -                      | - - -                    | - - -                       |
| 19      | 13 e                             | - - -                    | - - -                      | - - -                    | - - -                       |
| 20      | - -                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 21      | - -                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 22      | - -                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 23      | - -                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 24      | - -                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 25      | - -                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 26      | - -                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 27      | - -                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 28      | - -                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 29      | - -                              | - - -                    | - - -                      | - - -                    | - - -                       |
| 30      | - -                              | - - -                    | - - -                      | - - -                    | - - -                       |
| TOTAL   | 1076                             |                          |                            |                          |                             |
| AVERAGE | 57                               |                          |                            |                          |                             |
| MAXIMUM | 200                              |                          |                            |                          |                             |
| MINIMUM | 13                               |                          |                            |                          |                             |
| ACRE FT | 2130                             |                          |                            |                          |                             |

NOTE: e = estimated

Niguannak River  
1990



## ARCTIC NATIONAL WILDLIFE REFUGE

## Sadlerochit River

LOCATION.--Lat 69°38', long 144° 22'50", in NW&SW& sec. 31, T.4N., R.32E., 0.5 miles below the Wilderness boundary, 37.5 miles southwest of Kaktovik, Alaska.

DRAINAGE AREA.--520.1 mi<sup>2</sup>, of which 517.5 mi<sup>2</sup> is located within the Arctic National Wildlife Refuge Wilderness Area. Glaciers account for 2.3 percent of the drainage area or about 11.8 mi<sup>2</sup> depending on existing climatic conditions.

PERIOD OF RECORD.-- July to Sept. 1988; June to Sept. 1989; June to Sept. 1990.

REMARKS.--This is a 6th Order drainage. Discharge records are initiated during break-up and discontinued at freeze-up of each year.

EXTREMES FOR PERIOD OF RECORD.--Maximum Discharge, 5,733 cfs Aug. 4, 1989 @ 1545 hrs; Minimum Discharge, 70 cfs Sept. 27, 1988 @ 1145 hrs.

## JUNE 1990

| DATE    | AVE.DAILY<br>DISCH.<br>CU.FT/SEC | TIME<br>OF MAX<br>DISCH. | MAX<br>DISCH.<br>CU FT/SEC | TIME<br>OF MIN<br>DISCH. | MIN<br>DISCH.<br>CU. FT/SEC |
|---------|----------------------------------|--------------------------|----------------------------|--------------------------|-----------------------------|
| 1       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 2       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 3       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 4       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 5       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 6       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 7       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 8       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 9       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 10      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 11      | 177                              | 1842                     | 186                        | 0412                     | 167                         |
| 12      | 200                              | 1102                     | 215                        | 0027                     | 177                         |
| 13      | 459                              | 2357                     | 618                        | 0002                     | 209                         |
| 14      | 557                              | 2357                     | 740                        | 1747                     | 447                         |
| 15      | 1065                             | 2347                     | 3951                       | 1812                     | 732                         |
| 16      | 2578                             | 0152                     | 4360                       | 1732                     | 1605                        |
| 17      | 1889                             | 0542                     | 2618                       | 1942                     | 1391                        |
| 18      | 2678                             | 0537                     | 4857                       | 0027                     | 1842                        |
| 19      | 2052                             | 2327                     | 4502                       | 1657                     | 1495                        |
| 20      | 2520                             | 0022                     | 4589                       | 2357                     | 1563                        |
| 21      | 1328                             | 2357                     | 1827                       | 1732                     | 1152                        |
| 22      | 1550                             | 0252                     | 1953                       | 2352                     | 1220                        |
| 23      | 1086                             | 0032                     | 1244                       | 2142                     | 954                         |
| 24      | 869                              | 0027                     | 983                        | 2217                     | 748                         |
| 25      | 740                              | 0732                     | 781                        | 2107                     | 685                         |
| 26      | 773                              | 0532                     | 833                        | 0002                     | 708                         |
| 27      | 896                              | 2357                     | 1378                       | 0012                     | 773                         |
| 28      | 1550                             | 1257                     | 2189                       | 0447                     | 1197                        |
| 29      | 1634                             | 2357                     | 2296                       | 2037                     | 1316                        |
| 30      | 2069                             | 0352                     | 2992                       | 2317                     | 1550                        |
| TOTAL   | 26668                            | - - -                    | - - -                      | - - -                    | - - -                       |
| AVERAGE | 1333                             |                          | 2156                       |                          | 997                         |
| MAXIMUM | 2678                             |                          | 4857                       |                          | 1842                        |
| MINIMUM | 177                              |                          | 186                        |                          | 167                         |
| ACRE FT | 52803                            | - - -                    | - - -                      | - - -                    | - - -                       |

## ARCTIC NATIONAL WILDLIFE REFUGE

## Sadlerochit River

JULY 1990

| DATE    | AVE.DAILY<br>DISCH.<br>CU.FT/SEC | TIME<br>OF MAX<br>DISCH. | MAX<br>DISCH.<br>CU FT/SEC | TIME<br>OF MIN<br>DISCH. | MIN<br>DISCH.<br>CU. FT/SEC |
|---------|----------------------------------|--------------------------|----------------------------|--------------------------|-----------------------------|
| 1       | 1416                             | 0027                     | 1605                       | 2137                     | 1244                        |
| 2       | 1255                             | 0652                     | 1403                       | 2342                     | 1130                        |
| 3       | 1119                             | 0902                     | 1186                       | 1947                     | 1055                        |
| 4       | 1055                             | 0242                     | 1130                       | 2147                     | 973                         |
| 5       | 983                              | 0802                     | 1024                       | 2157                     | 925                         |
| 6       | 954                              | 0842                     | 993                        | 2242                     | 915                         |
| 7       | 944                              | 0932                     | 993                        | 2212                     | 887                         |
| 8       | 887                              | 0752                     | 925                        | 2247                     | 833                         |
| 9       | 798                              | 0322                     | 851                        | 2332                     | 748                         |
| 10      | 756                              | 1127                     | 790                        | 2217                     | 708                         |
| 11      | 708                              | 0812                     | 732                        | 2352                     | 670                         |
| 12      | 700                              | 0957                     | 732                        | 0102                     | 670                         |
| 13      | 781                              | 1137                     | 860                        | 0022                     | 677                         |
| 14      | 993                              | 1557                     | 1108                       | 0002                     | 842                         |
| 15      | 1267                             | 0627                     | 1482                       | 0002                     | 1086                        |
| 16      | 1044                             | 0457                     | 1130                       | 2217                     | 934                         |
| 17      | 896                              | 0112                     | 944                        | 2357                     | 833                         |
| 18      | 815                              | 0017                     | 851                        | 2317                     | 773                         |
| 19      | 764                              | 0642                     | 798                        | 2342                     | 716                         |
| 20      | 732                              | 0652                     | 773                        | 2337                     | 685                         |
| 21      | 748                              | 2352                     | 815                        | 0012                     | 685                         |
| 22      | 1429                             | 1732                     | 1677                       | 0002                     | 824                         |
| 23      | 1429                             | 0102                     | 1522                       | 2352                     | 1340                        |
| 24      | 1174                             | 0017                     | 1365                       | 2302                     | 1034                        |
| 25      | 983                              | 0342                     | 1044                       | 2022                     | 925                         |
| 26      | 1044                             | 1402                     | 1108                       | 0017                     | 944                         |
| 27      | 896                              | 0022                     | 1013                       | 2352                     | 773                         |
| 28      | 708                              | 0002                     | 781                        | 2327                     | 647                         |
| 29      | 633                              | 0742                     | 655                        | 2352                     | 590                         |
| 30      | 670                              | 0712                     | 756                        | 0132                     | 590                         |
| 31      | 647                              | 0717                     | 685                        | 2342                     | 597                         |
| TOTAL   | 29232                            | - - -                    | - - -                      | - - -                    | - - -                       |
| AVERAGE | 943                              | 1024                     | 847                        |                          |                             |
| MAXIMUM | 1429                             | 1677                     | 1340                       |                          |                             |
| MINIMUM | 633                              | 655                      | 590                        |                          |                             |
| ACRE FT | 57879                            | - - -                    | - - -                      | - - -                    | - - -                       |

## ARCTIC NATIONAL WILDLIFE REFUGE

Sadlerochit River

AUGUST 1990

| DATE    | AVE.DAILY<br>DISCH.<br>CU.FT/SEC | TIME<br>OF MAX<br>DISCH. | MAX<br>DISCH.<br>CU FT/SEC | TIME<br>OF MIN<br>DISCH. | MIN<br>DISCH.<br>CU. FT/SEC |
|---------|----------------------------------|--------------------------|----------------------------|--------------------------|-----------------------------|
| 1       | 597                              | 1002                     | 625                        | 2247                     | 577                         |
| 2       | 584                              | 1127                     | 625                        | 2357                     | 550                         |
| 3       | 537                              | 0002                     | 550                        | 2247                     | 525                         |
| 4       | 506                              | 0147                     | 531                        | 2247                     | 482                         |
| 5       | 470                              | 0047                     | 488                        | 2327                     | 442                         |
| 6       | 426                              | 0017                     | 442                        | 2327                     | 399                         |
| 7       | 394                              | 0312                     | 405                        | 2317                     | 374                         |
| 8       | 374                              | 0012                     | 379                        | 2252                     | 360                         |
| 9       | 355                              | 1457                     | 370                        | 2352                     | 341                         |
| 10      | 341                              | 1532                     | 351                        | 2357                     | 332                         |
| 11      | 337                              | 1807                     | 346                        | 0632                     | 328                         |
| 12      | 337                              | 1407                     | 355                        | 0427                     | 324                         |
| 13      | 337                              | 1632                     | 355                        | 0552                     | 319                         |
| 14      | 360                              | 1252                     | 384                        | 0127                     | 328                         |
| 15      | 399                              | 1132                     | 420                        | 0047                     | 370                         |
| 16      | 436                              | 1147                     | 494                        | 0042                     | 389                         |
| 17      | 447                              | 1312                     | 464                        | 2357                     | 426                         |
| 18      | 442                              | 1537                     | 453                        | 0257                     | 426                         |
| 19      | 447                              | 1207                     | 459                        | 2352                     | 436                         |
| 20      | 442                              | 1432                     | 459                        | 2357                     | 426                         |
| 21      | 410                              | 0027                     | 431                        | 2347                     | 389                         |
| 22      | 374                              | 0007                     | 389                        | 2347                     | 355                         |
| 23      | 337                              | 0002                     | 355                        | 2312                     | 319                         |
| 24      | 307                              | 0007                     | 319                        | 2332                     | 290                         |
| 25      | 282                              | 0002                     | 294                        | 2332                     | 271                         |
| 26      | 271                              | 2117                     | 275                        | 0442                     | 267                         |
| 27      | 351                              | 2352                     | 597                        | 0252                     | 263                         |
| 28      | 662                              | 2247                     | 708                        | 0007                     | 590                         |
| 29      | 655                              | 0407                     | 740                        | 2342                     | 557                         |
| 30      | 500                              | 0012                     | 557                        | 2107                     | 464                         |
| 31      | 662                              | 1052                     | 716                        | 0007                     | 482                         |
| TOTAL   | 13381                            | - - -                    | - - -                      | - - -                    | - - -                       |
| AVERAGE | 432                              | 462                      |                            | 400                      |                             |
| MAXIMUM | 662                              | 740                      |                            | 590                      |                             |
| MINIMUM | 271                              | 275                      |                            | 263                      |                             |
| ACRE FT | 26493                            | - - -                    | - - -                      | - - -                    | - - -                       |

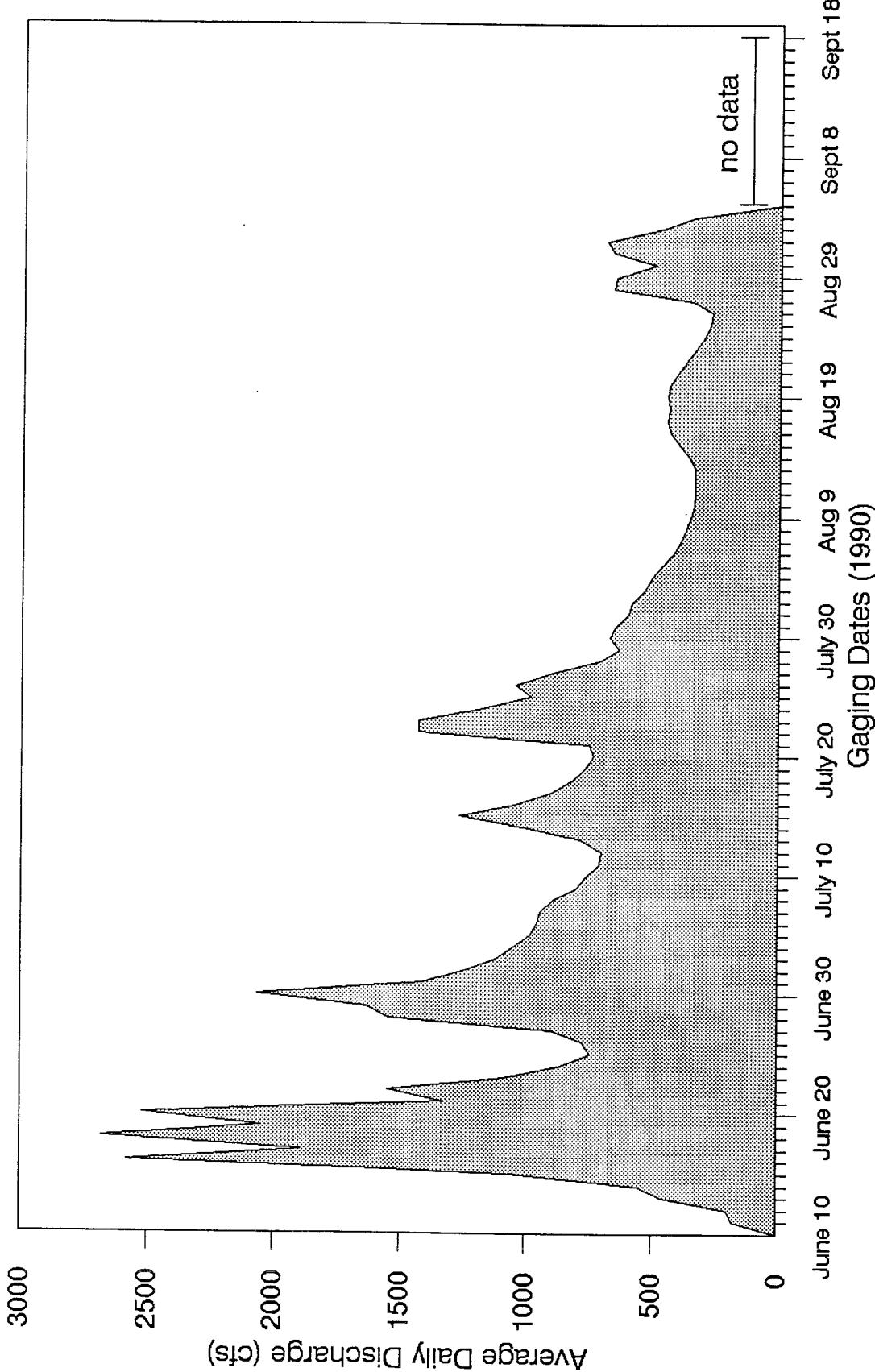
## ARCTIC NATIONAL WILDLIFE REFUGE

## Sadlerochit River

SEPTEMBER 1990

| DATE    | AVE.DAILY<br>DISCH.<br>CU.FT/SEC | TIME<br>OF MAX<br>DISCH. | MAX<br>DISCH.<br>CU FT/SEC | TIME<br>OF MIN<br>DISCH. | MIN<br>DISCH.<br>CU. FT/SEC |
|---------|----------------------------------|--------------------------|----------------------------|--------------------------|-----------------------------|
| 1       | 692                              | 0542                     | 807                        | 2322                     | 570                         |
| 2       | 476                              | 0042                     | 577                        | 2352                     | 410                         |
| 3       | 346                              | 0032                     | 410                        | 1517                     | 311                         |
| 4       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 5       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 6       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 7       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 8       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 9       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 10      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 11      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 12      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 13      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 14      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 15      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 16      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 17      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 18      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 19      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 20      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 21      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 22      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 23      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 24      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 25      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 26      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 27      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 28      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 29      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 30      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| TOTAL   | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| AVERAGE | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| MAXIMUM | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| MINIMUM | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| ACRE FT | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |

Sadlerochit River  
1990



## ARCTIC NATIONAL WILDLIFE REFUGE

## Sadlerochit Spring Creek

LOCATION.--Lat 69°39'53", Long 144°24'52", NE 1/4 NW 1/4 sec. 36, T.4N., R.31E., 3000 ft. downstream of Sadlerochit Spring, 37.5 mi. southwest of Kaktovik, Alaska.

DRAINAGE AREA.--0.5 mi<sup>2</sup>.

PERIOD OF RECORD.--July to Dec. 1988; June to Sept. 1989; June to Sept. 1990.

REMARKS.--This is a 2nd Order drainage with 2 springs contributing most of the flow.

EXTREMES FOR PERIOD OF RECORD.--Maximum Discharge, 108 cfs Aug. 20, 1989 @ 1345 hrs; Minimum Discharge, 28 cfs Aug. 15, 1988 @ 1815 hrs.

## JUNE 1990

| DATE    | AVE.DAILY<br>DISCH.<br>CU.FT/SEC | TIME<br>OF MAX<br>DISCH. | MAX<br>DISCH.<br>CU FT/SEC | TIME<br>OF MIN<br>DISCH. | MIN<br>DISCH.<br>CU. FT/SEC |
|---------|----------------------------------|--------------------------|----------------------------|--------------------------|-----------------------------|
| 1       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 2       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 3       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 4       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 5       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 6       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 7       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 8       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 9       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 10      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 11      | 39                               | 2042                     | 40                         | 0027                     | 38                          |
| 12      | 40                               | 0352                     | 40                         | 1247                     | 39                          |
| 13      | 40                               | 0937                     | 40                         | 1552                     | 40                          |
| 14      | 40                               | 0712                     | 40                         | 1522                     | 40                          |
| 15      | 40                               | 0757                     | 40                         | 1327                     | 40                          |
| 16      | 40                               | 0917                     | 40                         | 1347                     | 40                          |
| 17      | 40                               | 1022                     | 40                         | 0232                     | 40                          |
| 18      | 40                               | 1707                     | 41                         | 1202                     | 40                          |
| 19      | 40                               | 0017                     | 41                         | 1512                     | 40                          |
| 20      | 40                               | 0117                     | 40                         | 1922                     | 40                          |
| 21      | 40                               | 1637                     | 40                         | 0017                     | 40                          |
| 22      | 40                               | 0907                     | 40                         | 1617                     | 40                          |
| 23      | 40                               | 1047                     | 40                         | 1922                     | 40                          |
| 24      | 40                               | 1007                     | 40                         | 1822                     | 40                          |
| 25      | 40                               | 0917                     | 40                         | 1847                     | 40                          |
| 26      | 40                               | 0752                     | 40                         | 2012                     | 40                          |
| 27      | 40                               | 0242                     | 40                         | 1507                     | 40                          |
| 28      | 40                               | 0852                     | 40                         | 1837                     | 40                          |
| 29      | 40                               | 0802                     | 40                         | 2232                     | 40                          |
| 30      | 40                               | 0907                     | 40                         | 2257                     | 39                          |
| TOTAL   | 800                              | - - -                    | - - -                      | - - -                    | - - -                       |
| AVERAGE | 40                               |                          | 40                         |                          | 40                          |
| MAXIMUM | 40                               |                          | 41                         |                          | 40                          |
| MINIMUM | 39                               |                          | 40                         |                          | 38                          |
| ACRE FT | 1584                             | - - -                    | - - -                      | - - -                    | - - -                       |

## ARCTIC NATIONAL WILDLIFE REFUGE

## Sadlerochit Spring Creek

JULY 1990

| DATE    | AVE.DAILY<br>DISCH.<br>CU.FT/SEC | TIME<br>OF MAX<br>DISCH. | MAX<br>DISCH.<br>CU FT/SEC | TIME<br>OF MIN<br>DISCH. | MIN<br>DISCH.<br>CU. FT/SEC |
|---------|----------------------------------|--------------------------|----------------------------|--------------------------|-----------------------------|
| 1       | 40                               | 0527                     | 40                         | 1847                     | 39                          |
| 2       | 39                               | 0117                     | 40                         | 2337                     | 39                          |
| 3       | 39                               | 0907                     | 40                         | 0337                     | 39                          |
| 4       | 39                               | 0957                     | 39                         | 1332                     | 39                          |
| 5       | 39                               | 2022                     | 39                         | 1052                     | 39                          |
| 6       | 39                               | 0502                     | 40                         | 1742                     | 39                          |
| 7       | 39                               | 0322                     | 39                         | 1827                     | 39                          |
| 8       | 39                               | 0352                     | 39                         | 1742                     | 39                          |
| 9       | 38                               | 0057                     | 39                         | 2102                     | 38                          |
| 10      | 38                               | 0512                     | 38                         | 2357                     | 35                          |
| 11      | 36                               | 2347                     | 36                         | 0032                     | 35                          |
| 12      | 36                               | 0307                     | 36                         | 1942                     | 36                          |
| 13      | 36                               | 2232                     | 37                         | 1922                     | 36                          |
| 14      | 36                               | 2247                     | 37                         | 0817                     | 36                          |
| 15      | 36                               | 0007                     | 37                         | 1912                     | 36                          |
| 16      | 36                               | 0702                     | 37                         | 1342                     | 36                          |
| 17      | 36                               | 0252                     | 36                         | 1937                     | 36                          |
| 18      | 36                               | 0507                     | 36                         | 1342                     | 36                          |
| 19      | 36                               | 1742                     | 37                         | 1227                     | 36                          |
| 20      | 36                               | 0642                     | 36                         | 1227                     | 36                          |
| 21      | 36                               | 1012                     | 36                         | 1727                     | 36                          |
| 22      | 36                               | 0352                     | 36                         | 2147                     | 36                          |
| 23      | 37                               | 1407                     | 37                         | 0027                     | 36                          |
| 24      | 37                               | 0352                     | 37                         | 1702                     | 36                          |
| 25      | 37                               | 0842                     | 37                         | 1852                     | 36                          |
| 26      | 36                               | 0532                     | 37                         | 2152                     | 36                          |
| 27      | 36                               | 0512                     | 37                         | 2117                     | 36                          |
| 28      | 36                               | 0707                     | 37                         | 1747                     | 36                          |
| 29      | 36                               | 0832                     | 37                         | 2037                     | 36                          |
| 30      | 36                               | 0552                     | 37                         | 1707                     | 36                          |
| 31      | 36                               | 0512                     | 36                         | 2232                     | 36                          |
| TOTAL   | 1152                             | - - -                    | - - -                      | - - -                    | - - -                       |
| AVERAGE | 37                               | 37                       | 37                         | 37                       | 37                          |
| MAXIMUM | 40                               | 40                       | 40                         | 40                       | 39                          |
| MINIMUM | 36                               | 36                       | 36                         | 36                       | 35                          |
| ACRE FT | 2281                             | - - -                    | - - -                      | - - -                    | - - -                       |

## ARCTIC NATIONAL WILDLIFE REFUGE

## Sadlerochit Spring Creek

AUGUST 1990

| DATE    | AVE.DAILY<br>DISCH.<br>CU.FT/SEC | TIME<br>OF MAX<br>DISCH. | MAX<br>DISCH.<br>CU FT/SEC | TIME<br>OF MIN<br>DISCH. | MIN<br>DISCH.<br>CU. FT/SEC |
|---------|----------------------------------|--------------------------|----------------------------|--------------------------|-----------------------------|
| 1       | 36                               | 0612                     | 36                         | 1947                     | 36                          |
| 2       | 36                               | 0547                     | 36                         | 1412                     | 36                          |
| 3       | 36                               | 0627                     | 36                         | 2157                     | 36                          |
| 4       | 36                               | 0427                     | 36                         | 1927                     | 36                          |
| 5       | 36                               | 0332                     | 36                         | 1612                     | 36                          |
| 6       | 36                               | 0432                     | 36                         | 1617                     | 36                          |
| 7       | 36                               | 0612                     | 36                         | 1722                     | 36                          |
| 8       | 36                               | 0537                     | 36                         | 1617                     | 36                          |
| 9       | 36                               | 0522                     | 36                         | 1807                     | 36                          |
| 10      | 36                               | 0037                     | 36                         | 1632                     | 36                          |
| 11      | 36                               | 0512                     | 36                         | 1642                     | 36                          |
| 12      | 36                               | 0012                     | 36                         | 1732                     | 36                          |
| 13      | 36                               | 0502                     | 36                         | 1437                     | 36                          |
| 14      | 36                               | 0652                     | 36                         | 1722                     | 36                          |
| 15      | 36                               | 0557                     | 36                         | 1647                     | 36                          |
| 16      | 36                               | 0502                     | 36                         | 1627                     | 36                          |
| 17      | 36                               | 0527                     | 36                         | 1547                     | 36                          |
| 18      | 36                               | 0502                     | 36                         | 1847                     | 36                          |
| 19      | 36                               | 1317                     | 36                         | 0112                     | 36                          |
| 20      | 36                               | 0437                     | 37                         | 0447                     | 35                          |
| 21      | 36                               | 0602                     | 36                         | 1752                     | 36                          |
| 22      | 36                               | 0547                     | 36                         | 1607                     | 36                          |
| 23      | 36                               | 0507                     | 36                         | 1347                     | 35                          |
| 24      | 35                               | 0537                     | 36                         | 1617                     | 35                          |
| 25      | 35                               | 0637                     | 36                         | 1517                     | 35                          |
| 26      | 36                               | 0552                     | 36                         | 1522                     | 35                          |
| 27      | 36                               | 0702                     | 36                         | 1512                     | 35                          |
| 28      | 36                               | 0712                     | 36                         | 1702                     | 35                          |
| 29      | 36                               | 0727                     | 36                         | 0007                     | 35                          |
| 30      | 35                               | 0602                     | 36                         | 1237                     | 35                          |
| 31      | 36                               | 1802                     | 36                         | 1102                     | 35                          |
| TOTAL   | 1110                             | - - -                    | - - -                      | - - -                    | - - -                       |
| AVERAGE | 36                               | 36                       | 36                         | 36                       | 36                          |
| MAXIMUM | 36                               | 37                       | 37                         | 36                       | 36                          |
| MINIMUM | 35                               | 36                       | 36                         | 35                       | 35                          |
| ACRE FT | 2199                             | - - -                    | - - -                      | - - -                    | - - -                       |

## ARCTIC NATIONAL WILDLIFE REFUGE

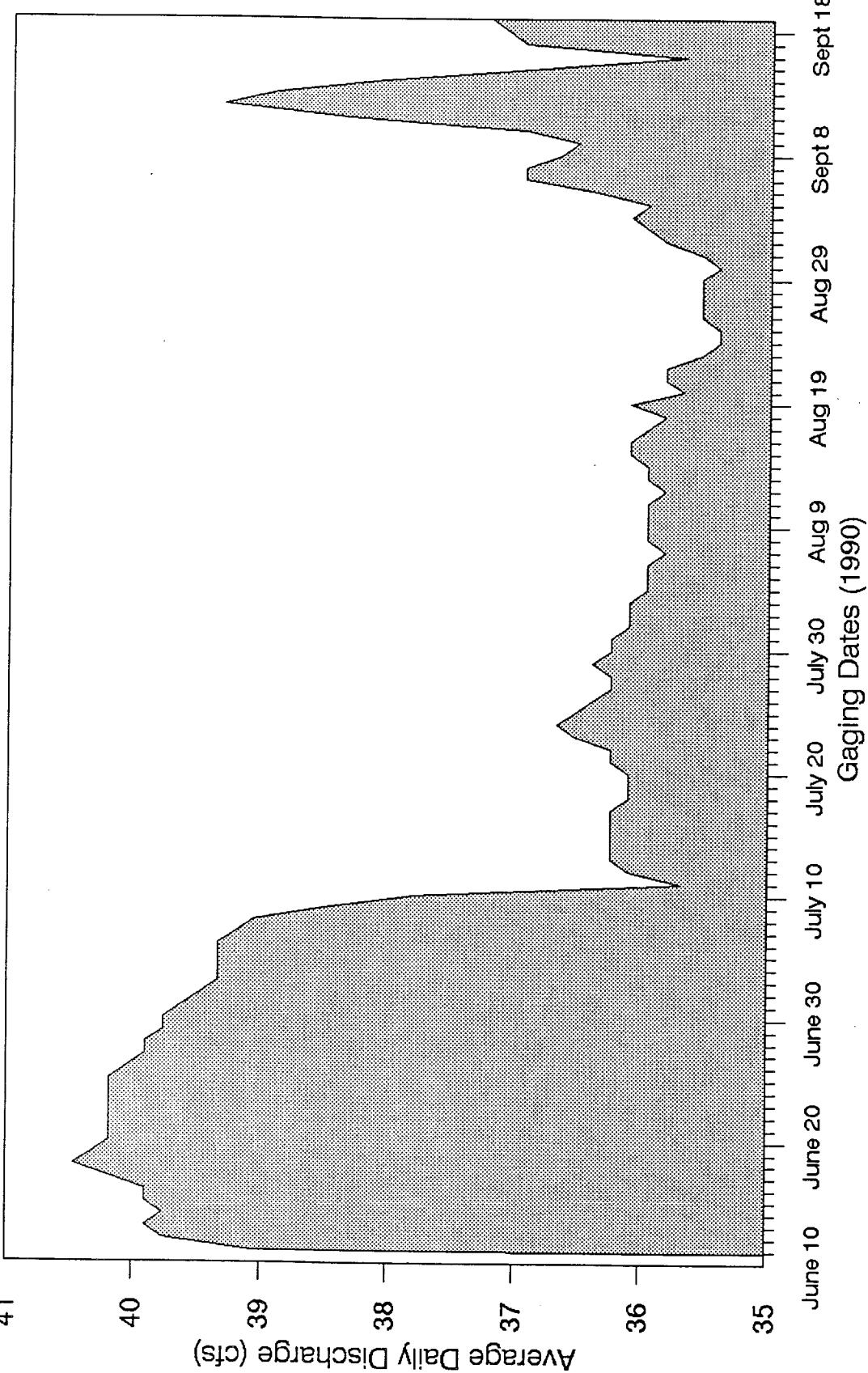
## Sadlerochit Spring Creek

SEPTEMBER 1990

| DATE    | AVE.DAILY<br>DISCH.<br>CU.FT/SEC | TIME<br>OF MAX<br>DISCH. | MAX<br>DISCH.<br>CU FT/SEC | TIME<br>OF MIN<br>DISCH. | MIN<br>DISCH.<br>CU. FT/SEC |
|---------|----------------------------------|--------------------------|----------------------------|--------------------------|-----------------------------|
| 1       | 36                               | 0432                     | 36                         | 2022                     | 36                          |
| 2       | 36                               | 1327                     | 36                         | 0157                     | 36                          |
| 3       | 36                               | 0627                     | 36                         | 1552                     | 36                          |
| 4       | 36                               | 0507                     | 36                         | 1737                     | 36                          |
| 5       | 36                               | 0612                     | 37                         | 0017                     | 36                          |
| 6       | 37                               | 2147                     | 37                         | 0022                     | 36                          |
| 7       | 37                               | 0812                     | 37                         | 2242                     | 37                          |
| 8       | 37                               | 0147                     | 37                         | 1537                     | 36                          |
| 9       | 37                               | 0542                     | 37                         | 1502                     | 36                          |
| 10      | 37                               | 2357                     | 40                         | 1542                     | 36                          |
| 11      | 38                               | 2007                     | 40                         | 0547                     | 37                          |
| 12      | 39                               | 0032                     | 40                         | 2207                     | 39                          |
| 13      | 39                               | 1947                     | 39                         | 0857                     | 39                          |
| 14      | 38                               | 0022                     | 39                         | 2142                     | 36                          |
| 15      | 37                               | 0637                     | 37                         | 2352                     | 35                          |
| 16      | 36                               | 0707                     | 37                         | 0042                     | 29                          |
| 17      | 37                               | 0337                     | 37                         | 1737                     | 37                          |
| 18      | 37                               | 0612                     | 37                         | 1517                     | 37                          |
| 19      | 37                               | 0342                     | 38                         | 1317                     | 37                          |
| 20      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 21      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 22      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 23      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 24      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 25      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 26      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 27      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 28      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 29      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 30      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| TOTAL   | 703                              | - - -                    | - - -                      | - - -                    | - - -                       |
| AVERAGE | 37                               |                          | 38                         |                          | 36                          |
| MAXIMUM | 39                               |                          | 40                         |                          | 39                          |
| MINIMUM | 36                               |                          | 36                         |                          | 29                          |
| ACRE FT | 1391                             | - - -                    | - - -                      | - - -                    | - - -                       |

Sadlerochit Springs Creek  
1990

41



## ARCTIC NATIONAL WILDLIFE REFUGE

## Sikrelurak River

LOCATION.--Lat 69°54'43", Long 142°30'52", SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 36, T.7N., R.38E., at confluence with the West Fork Sikrelurak River, 31 mi south-east of Kaktovik, Alaska.

DRAINAGE AREA.-74.7 mi<sup>2</sup>.

PERIOD OF RECORD.--June to Sept. 1989; June to Sept. 1990.

REMARKS.--This is a 4th Order drainage. Discharge records are initiated during break-up and discontinued at freeze-up of each year.

EXTREMES FOR PERIOD OF RECORD.--Maximum Discharge, 282 cfs Aug. 20 and 21, 1989; Minimum Discharge, 0 cfs August 14-28, 1990.

## JUNE 1990

| DATE    | AVE.DAILY<br>DISCH.<br>CU.FT/SEC | TIME<br>OF MAX<br>DISCH. | MAX<br>DISCH.<br>CU FT/SEC | TIME<br>OF MIN<br>DISCH. | MIN<br>DISCH.<br>CU. FT/SEC |
|---------|----------------------------------|--------------------------|----------------------------|--------------------------|-----------------------------|
| 1       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 2       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 3       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 4       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 5       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 6       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 7       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 8       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 9       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 10      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 11      | 29.5                             | 0007                     | 39.3                       | 0627                     | 24.5                        |
| 12      | 37.8                             | 2342                     | 61.2                       | 0007                     | 28.2                        |
| 13      | 47.1                             | 2142                     | 61.2                       | 0907                     | 37.8                        |
| 14      | 45.5                             | 2127                     | 61.2                       | 1057                     | 36.3                        |
| 15      | 43.9                             | 0002                     | 57.5                       | 1137                     | 34.9                        |
| 16      | 34.9                             | 0002                     | 48.8                       | 1237                     | 28.2                        |
| 17      | 30.8                             | 2257                     | 37.8                       | 1317                     | 24.5                        |
| 18      | 33.5                             | 2122                     | 42.3                       | 1027                     | 25.7                        |
| 19      | 30.8                             | 0007                     | 39.3                       | 1047                     | 24.5                        |
| 20      | 33.5                             | 1957                     | 48.8                       | 0937                     | 24.5                        |
| 21      | 32.1                             | 2047                     | 42.3                       | 1017                     | 22.2                        |
| 22      | 30.8                             | 2032                     | 42.3                       | 1012                     | 21.1                        |
| 23      | 29.5                             | 1852                     | 39.3                       | 1052                     | 21.1                        |
| 24      | 21.1                             | 0002                     | 32.1                       | 1202                     | 15.9                        |
| 25      | 20.0                             | 2107                     | 30.8                       | 1002                     | 14.1                        |
| 26      | 16.9                             | 0002                     | 26.9                       | 1057                     | 12.3                        |
| 27      | 15.0                             | 2302                     | 23.3                       | 1127                     | 10.7                        |
| 28      | 16.9                             | 2102                     | 25.7                       | 1147                     | 10.7                        |
| 29      | 15.0                             | 0002                     | 23.3                       | 1152                     | 10.7                        |
| 30      | 10.7                             | 0002                     | 15.9                       | 1137                     | 7.8                         |
| TOTAL   | 575.2                            | - - -                    | - - -                      | - - -                    | - - -                       |
| AVERAGE | 28.8                             |                          | 40.0                       |                          | 21.8                        |
| MAXIMUM | 47.1                             |                          | 61.2                       |                          | 37.8                        |
| MINIMUM | 10.7                             |                          | 15.9                       |                          | 7.8                         |
| ACRE FT | 1138.9                           | - - -                    | - - -                      | - - -                    | - - -                       |

## ARCTIC NATIONAL WILDLIFE REFUGE

## Sikrelurak River

JULY 1990

| DATE    | AVE.DAILY<br>DISCH.<br>CU.FT/SEC | TIME<br>OF MAX<br>DISCH. | MAX<br>DISCH.<br>CU FT/SEC | TIME<br>OF MIN<br>DISCH. | MIN<br>DISCH.<br>CU. FT/SEC |
|---------|----------------------------------|--------------------------|----------------------------|--------------------------|-----------------------------|
| 1       | 9.2                              | 0007                     | 14.1                       | 1237                     | 6.5                         |
| 2       | 8.5                              | 2152                     | 14.1                       | 1232                     | 5.3                         |
| 3       | 8.5                              | 0007                     | 13.2                       | 1452                     | 5.3                         |
| 4       | 5.3                              | 0002                     | 9.9                        | 1852                     | 3.8                         |
| 5       | 4.3                              | 0052                     | 5.9                        | 2057                     | 2.9                         |
| 6       | 3.8                              | 0142                     | 4.8                        | 2112                     | 2.5                         |
| 7       | 2.2                              | 0337                     | 3.8                        | 2357                     | 1.2                         |
| 8       | 2.9                              | 1532                     | 4.8                        | 0012                     | 1.2                         |
| 9       | 2.5                              | 0002                     | 3.3                        | 2357                     | 1.8                         |
| 10      | 2.2                              | 1247                     | 2.2                        | 2347                     | 1.8                         |
| 11      | 1.8                              | 1547                     | 1.8                        | 2337                     | 1.2                         |
| 12      | 1.5                              | 1242                     | 1.8                        | 2352                     | 1.2                         |
| 13      | 1.2                              | 1222                     | 1.5                        | 2357                     | 1.0                         |
| 14      | 1.0                              | 1527                     | 1.2                        | 2352                     | 0.7                         |
| 15      | 0.7                              | 1427                     | 1.0                        | 2347                     | 0.5                         |
| 16      | 0.5                              | 1552                     | 0.7                        | 0702                     | 0.4                         |
| 17      | 1.0                              | 2017                     | 1.2                        | 0017                     | 0.4                         |
| 18      | 1.0                              | 0002                     | 1.0                        | 2342                     | 0.7                         |
| 19      | 0.5                              | 0012                     | 0.7                        | 2352                     | 0.5                         |
| 20      | 0.4                              | 1447                     | 0.5                        | 2352                     | 0.4                         |
| 21      | 0.5                              | 2307                     | 0.7                        | 0322                     | 0.2                         |
| 22      | 2.5                              | 1747                     | 3.3                        | 0012                     | 0.7                         |
| 23      | 2.9                              | 0007                     | 3.3                        | 2357                     | 1.8                         |
| 24      | 1.2                              | 0002                     | 1.8                        | 2337                     | 1.0                         |
| 25      | 0.7                              | 0222                     | 1.0                        | 2327                     | 0.5                         |
| 26      | 0.7                              | 1022                     | 0.7                        | 2357                     | 0.5                         |
| 27      | 0.5                              | 1332                     | 0.7                        | 2357                     | 0.4                         |
| 28      | 0.4                              | 1532                     | 0.5                        | 2327                     | 0.4                         |
| 29      | 0.4                              | 1322                     | 0.5                        | 0027                     | 0.2                         |
| 30      | 0.4                              | 1437                     | 0.5                        | 2352                     | 0.2                         |
| 31      | 0.4                              | 1807                     | 0.4                        | 0057                     | 0.2                         |
| TOTAL   | 69.6                             | - - -                    | - - -                      | - - -                    | - - -                       |
| AVERAGE | 2.2                              | 3.3                      |                            |                          | 1.5                         |
| MAXIMUM | 9.2                              | 14.1                     |                            |                          | 6.5                         |
| MINIMUM | 0.4                              | 0.4                      |                            |                          | 0.2                         |
| ACRE FT | 137.7                            | - - -                    | - - -                      | - - -                    | - - -                       |

## ARCTIC NATIONAL WILDLIFE REFUGE

## Sikrelurak River

AUGUST 1990

| DATE    | AVE.DAILY<br>DISCH.<br>CU.FT/SEC | TIME<br>OF MAX<br>DISCH. | MAX<br>DISCH.<br>CU FT/SEC | TIME<br>OF MIN<br>DISCH. | MIN<br>DISCH.<br>CU. FT/SEC |
|---------|----------------------------------|--------------------------|----------------------------|--------------------------|-----------------------------|
| 1       | 0.4                              | 1617                     | 0.4                        | 2357                     | 0.2                         |
| 2       | 0.2                              | 1517                     | 0.4                        | 2032                     | 0.1                         |
| 3       | 0.4                              | 1337                     | 0.5                        | 0142                     | 0.1                         |
| 4       | 0.5                              | 1457                     | 0.7                        | 0812                     | 0.4                         |
| 5       | 0.5                              | 1502                     | 0.7                        | 2327                     | 0.4                         |
| 6       | 0.4                              | 1512                     | 0.5                        | 2102                     | 0.2                         |
| 7       | 0.2                              | 1402                     | 0.5                        | 0722                     | 0.2                         |
| 8       | 0.4                              | 2247                     | 0.4                        | 0022                     | 0.2                         |
| 9       | 0.4                              | 0047                     | 0.4                        | 2357                     | 0.2                         |
| 10      | 0.2                              | 1927                     | 0.2                        | 0347                     | 0.2                         |
| 11      | 0.2                              | 1707                     | 0.4                        | 0147                     | 0.2                         |
| 12      | 0.2                              | 1547                     | 0.4                        | 0342                     | 0.2                         |
| 13      | 0.2                              | 1602                     | 0.4                        | 2357                     | 0.1                         |
| 14      | 0.1                              | 1352                     | 0.2                        | 2357                     | 0.0                         |
| 15      | 0.1                              | 1537                     | 0.2                        | 0137                     | 0.0                         |
| 16      | 0.1                              | 1357                     | 0.2                        | 2332                     | 0.0                         |
| 17      | 0.0                              | 1522                     | 0.2                        | 0337                     | 0.0                         |
| 18      | 0.0                              | 1757                     | 0.1                        | 0157                     | 0.0                         |
| 19      | 0.1                              | 1227                     | 0.2                        | 2342                     | 0.0                         |
| 20      | 0.0                              | 1512                     | 0.0                        | 2157                     | 0.0                         |
| 21      | 0.0                              | 1457                     | 0.1                        | 2357                     | 0.0                         |
| 22      | 0.0                              | 0007                     | 0.0                        | 2347                     | 0.0                         |
| 23      | 0.0                              | 1622                     | 0.0                        | 0317                     | 0.0                         |
| 24      | 0.0                              | 1622                     | 0.0                        | 0102                     | 0.0                         |
| 25      | 0.0                              | 1157                     | 0.0                        | 2247                     | 0.0                         |
| 26      | 0.0                              | 2317                     | 0.0                        | 0037                     | 0.0                         |
| 27      | 0.0                              | 2322                     | 0.1                        | 1722                     | 0.0                         |
| 28      | 0.5                              | 1752                     | 1.0                        | 0012                     | 0.0                         |
| 29      | 0.7                              | 1107                     | 1.0                        | 0342                     | 0.5                         |
| 30      | 0.7                              | 2357                     | 1.2                        | 0752                     | 0.7                         |
| 31      | 1.5                              | 2357                     | 2.9                        | 1837                     | 1.2                         |
| TOTAL   | 8.3                              | - - -                    | - - -                      | - - -                    | - - -                       |
| AVERAGE | 0.3                              |                          | 0.4                        |                          | 0.2                         |
| MAXIMUM | 1.5                              |                          | 2.9                        |                          | 1.2                         |
| MINIMUM | 0.0                              |                          | 0.0                        |                          | 0.0                         |
| ACRE FT | 16.5                             | - - -                    | - - -                      | - - -                    | - - -                       |

## ARCTIC NATIONAL WILDLIFE REFUGE

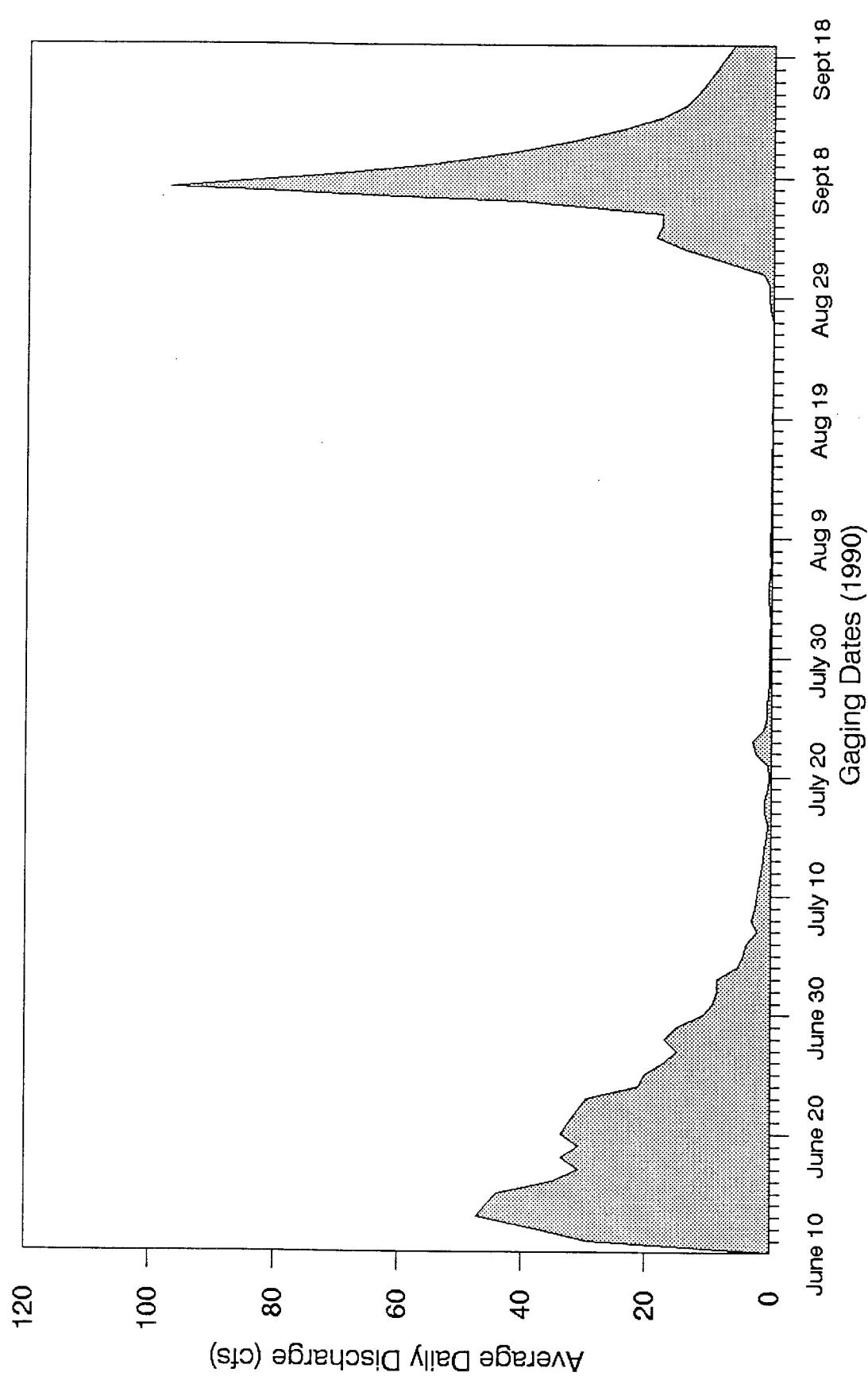
## Sikrelurak River

SEPTEMBER 1990

| DATE    | AVE.DAILY<br>DISCH.<br>CU.FT/SEC | TIME<br>OF MAX<br>DISCH. | MAX<br>DISCH.<br>CU FT/SEC | TIME<br>OF MIN<br>DISCH. | MIN<br>DISCH.<br>CU. FT/SEC |
|---------|----------------------------------|--------------------------|----------------------------|--------------------------|-----------------------------|
| 1       | 7.8                              | 2322                     | 12.3                       | 0002                     | 2.9                         |
| 2       | 14.1                             | 2312                     | 16.9                       | 0937                     | 11.5                        |
| 3       | 18.9                             | 1402                     | 21.1                       | 0007                     | 16.9                        |
| 4       | 17.9                             | 0232                     | 18.9                       | 2202                     | 16.9                        |
| 5       | 17.9                             | 2357                     | 18.9                       | 0027                     | 16.9                        |
| 6       | 40.8                             | 2357                     | 106.9                      | 0002                     | 18.9                        |
| 7       | 97.2                             | 0102                     | 117.1                      | 2257                     | 85.8                        |
| 8       | 75.1                             | 0007                     | 90.3                       | 2007                     | 67.0                        |
| 9       | 55.7                             | 0007                     | 69.0                       | 2357                     | 48.8                        |
| 10      | 42.3                             | 1447                     | 65.0                       | 0857                     | 26.9                        |
| 11      | 32.1                             | 1507                     | 50.5                       | 0937                     | 20.0                        |
| 12      | 24.5                             | 0017                     | 29.5                       | 0822                     | 18.9                        |
| 13      | 17.9                             | 1647                     | 22.2                       | 0807                     | 11.5                        |
| 14      | 14.1                             | 0007                     | 15.9                       | 2357                     | 13.2                        |
| 15      | 12.3                             | 0012                     | 13.2                       | 2332                     | 11.5                        |
| 16      | 10.7                             | 1157                     | 11.5                       | 1017                     | 9.2                         |
| 17      | 9.2                              | 0022                     | 9.2                        | 2337                     | 7.8                         |
| 18      | 7.8                              | 0832                     | 9.9                        | 2357                     | 6.5                         |
| 19      | 6.5                              | 0042                     | 7.1                        | 2237                     | 5.3                         |
| 20      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 21      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 22      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 23      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 24      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 25      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 26      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 27      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 28      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 29      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 30      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| TOTAL   | 522.8                            | - - -                    | - - -                      | - - -                    | - - -                       |
| AVERAGE | 27.5                             |                          | 37.1                       |                          | 21.9                        |
| MAXIMUM | 97.2                             |                          | 117.1                      |                          | 85.8                        |
| MINIMUM | 6.5                              |                          | 7.1                        |                          | 2.9                         |
| ACRE FT | 1035.2                           |                          | - - -                      |                          | - - -                       |

## Sikreluriak River

1990



## ARCTIC NATIONAL WILDLIFE REFUGE

## Tamayariak River

LOCATION.--Lat 69°49'58", long 145°33'10", in SW¼NE¼ sec. 35, T.6N., R.26E., 11.8 miles upstream from the confluence of the West Fork, Tamayariak River, 53 miles west-southwest of Kaktovik, Alaska.

DRAINAGE AREA.--136.1 mi<sup>2</sup>, of which 56.8 mi<sup>2</sup> is located within the Arctic National Wildlife Refuge Wilderness Area.

PERIOD OF RECORD.--July to Sept. 1988; June to Sept. 1989; June to Sept. 1990.

REMARKS.--This is a 5th Order drainage. Discharge records are initiated during break-up and discontinued at freeze-up of each year.

EXTREMES FOR PERIOD OF RECORD.--Maximum Discharge, 1,996 ft<sup>3</sup>/s Aug. 12, 1988 @ 1445 hrs; Minimum Discharge, 12 ft<sup>3</sup>/s Sept. 26, 1988 @ 1300 hrs.

## JUNE 1990

| DATE    | AVE.DAILY<br>DISCH.<br>CU.FT/SEC | TIME<br>OF MAX<br>DISCH. | MAX<br>DISCH.<br>CU FT/SEC | TIME<br>OF MIN<br>DISCH. | MIN<br>DISCH.<br>CU. FT/SEC |
|---------|----------------------------------|--------------------------|----------------------------|--------------------------|-----------------------------|
| 1       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 2       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 3       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 4       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 5       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 6       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 7       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 8       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 9       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 10      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 11      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 12      | 124                              | 2355                     | 171                        | 2400                     | 107                         |
| 13      | 228                              | 2345                     | 300                        | 0010                     | 171                         |
| 14      | 260                              | 2350                     | 405                        | 1415                     | 192                         |
| 15      | 412                              | 2300                     | 1719                       | 1545                     | 243                         |
| 16      | 794                              | 2400                     | 1609                       | 1830                     | 565                         |
| 17      | 535                              | 0120                     | 833                        | 2350                     | 428                         |
| 18      | 313                              | 2400                     | 428                        | 1615                     | 265                         |
| 19      | 228                              | 0005                     | 294                        | 1520                     | 196                         |
| 20      | 187                              | 0055                     | 249                        | 1625                     | 160                         |
| 21      | 153                              | 0220                     | 187                        | 2010                     | 133                         |
| 22      | 136                              | 0235                     | 153                        | 1655                     | 124                         |
| 23      | 153                              | 0935                     | 196                        | 2345                     | 133                         |
| 24      | 105                              | 2400                     | 133                        | 2125                     | 86                          |
| 25      | 93                               | 2355                     | 110                        | 1735                     | 86                          |
| 26      | 107                              | 0330                     | 127                        | 1825                     | 93                          |
| 27      | 88                               | 0155                     | 102                        | 1535                     | 80                          |
| 28      | 130                              | 1545                     | 223                        | 0010                     | 86                          |
| 29      | 160                              | 2350                     | 319                        | 1525                     | 121                         |
| 30      | 249                              | 0040                     | 326                        | 2340                     | 175                         |
| TOTAL   | 4455                             | - - -                    | - - -                      | - - -                    | - - -                       |
| AVERAGE | 234                              |                          | 415                        |                          | 181                         |
| MAXIMUM | 794                              |                          | 1719                       |                          | 565                         |
| MINIMUM | 88                               |                          | 102                        |                          | 80                          |
| ACRE FT | 8821                             |                          | - - -                      |                          | - - -                       |

## ARCTIC NATIONAL WILDLIFE REFUGE

Tamayariak River

JULY 1990

| DATE    | AVE.DAILY<br>DISCH.<br>CU.FT/SEC | TIME<br>OF MAX<br>DISCH. | MAX<br>DISCH.<br>CU FT/SEC | TIME<br>OF MIN<br>DISCH. | MIN<br>DISCH.<br>CU. FT/SEC |
|---------|----------------------------------|--------------------------|----------------------------|--------------------------|-----------------------------|
| 1       | 133                              | 0005                     | 175                        | 2335                     | 102                         |
| 2       | 91                               | 0205                     | 105                        | 2315                     | 74                          |
| 3       | 69                               | 0345                     | 78                         | 2230                     | 56                          |
| 4       | 55                               | 1105                     | 61                         | 2215                     | 48                          |
| 5       | 48                               | 0830                     | 53                         | 2210                     | 43                          |
| 6       | 44                               | 0805                     | 48                         | 2340                     | 39                          |
| 7       | 41                               | 2355                     | 48                         | 0040                     | 39                          |
| 8       | 52                               | 0740                     | 55                         | 2400                     | 48                          |
| 9       | 48                               | 2400                     | 50                         | 2210                     | 45                          |
| 10      | 43                               | 0025                     | 46                         | 2350                     | 39                          |
| 11      | 38                               | 0820                     | 40                         | 2355                     | 33                          |
| 12      | 33                               | 0840                     | 35                         | 2210                     | 30                          |
| 13      | 30                               | 1225                     | 31                         | 1730                     | 29                          |
| 14      | 31                               | 2255                     | 32                         | 0005                     | 29                          |
| 15      | 33                               | 1025                     | 37                         | 0425                     | 31                          |
| 16      | 32                               | 1305                     | 33                         | 2245                     | 30                          |
| 17      | 33                               | 2125                     | 35                         | 0020                     | 31                          |
| 18      | 33                               | 2400                     | 34                         | 2135                     | 30                          |
| 19      | 31                               | 1055                     | 32                         | 2345                     | 29                          |
| 20      | 30                               | 1120                     | 31                         | 2110                     | 29                          |
| 21      | 33                               | 2355                     | 43                         | 0025                     | 29                          |
| 22      | 146                              | 0540                     | 205                        | 2400                     | 43                          |
| 23      | 118                              | 0005                     | 136                        | 2355                     | 98                          |
| 24      | 86                               | 0005                     | 98                         | 2355                     | 74                          |
| 25      | 71                               | 0015                     | 76                         | 2340                     | 64                          |
| 26      | 61                               | 0030                     | 64                         | 2015                     | 56                          |
| 27      | 67                               | 1155                     | 73                         | 2400                     | 58                          |
| 28      | 62                               | 0005                     | 66                         | 2245                     | 56                          |
| 29      | 53                               | 0120                     | 56                         | 2350                     | 48                          |
| 30      | 45                               | 0015                     | 48                         | 2245                     | 41                          |
| 31      | 41                               | 1030                     | 43                         | 2350                     | 38                          |
| TOTAL   | 1731                             | - - -                    | - - -                      | - - -                    | - - -                       |
| AVERAGE | 56                               | 63                       |                            |                          | 46                          |
| MAXIMUM | 146                              | 205                      |                            |                          | 102                         |
| MINIMUM | 30                               | 31                       |                            |                          | 29                          |
| ACRE FT | 3427                             | - - -                    | - - -                      | - - -                    | - - -                       |

## ARCTIC NATIONAL WILDLIFE REFUGE

Tamayariak River

AUGUST 1990

| DATE    | AVE.DAILY<br>DISCH.<br>CU.FT/SEC | TIME<br>OF MAX<br>DISCH. | MAX<br>DISCH.<br>CU FT/SEC | TIME<br>OF MIN<br>DISCH. | MIN<br>DISCH.<br>CU. FT/SEC |
|---------|----------------------------------|--------------------------|----------------------------|--------------------------|-----------------------------|
| 1       | 38                               | 1130                     | 40                         | 2340                     | 34                          |
| 2       | 34                               | 1130                     | 35                         | 2025                     | 32                          |
| 3       | 34                               | 2120                     | 35                         | 0020                     | 32                          |
| 4       | 35                               | 1050                     | 37                         | 2315                     | 33                          |
| 5       | 33                               | 1020                     | 35                         | 2315                     | 29                          |
| 6       | 30                               | 0850                     | 32                         | 2120                     | 27                          |
| 7       | 29                               | 0935                     | 29                         | 2210                     | 27                          |
| 8       | 28                               | 1205                     | 28                         | 2340                     | 27                          |
| 9       | 27                               | 1230                     | 28                         | 2215                     | 26                          |
| 10      | 27                               | 1225                     | 28                         | 2125                     | 24                          |
| 11      | 26                               | 1205                     | 27                         | 2205                     | 23                          |
| 12      | 23                               | 1125                     | 26                         | 2305                     | 21                          |
| 13      | 21                               | 0910                     | 23                         | 2105                     | 19                          |
| 14      | 21                               | 0920                     | 22                         | 2235                     | 19                          |
| 15      | 21                               | 0945                     | 22                         | 2055                     | 20                          |
| 16      | 26                               | 2350                     | 31                         | 0115                     | 21                          |
| 17      | 32                               | 1045                     | 34                         | 2020                     | 29                          |
| 18      | 30                               | 1425                     | 31                         | 1955                     | 29                          |
| 19      | 29                               | 1145                     | 31                         | 2040                     | 28                          |
| 20      | 29                               | 1105                     | 30                         | 0005                     | 28                          |
| 21      | 30                               | 1255                     | 31                         | 2350                     | 28                          |
| 22      | 29                               | 1015                     | 30                         | 2040                     | 27                          |
| 23      | 28                               | 1145                     | 29                         | 2115                     | 26                          |
| 24      | 27                               | 1130                     | 28                         | 2335                     | 24                          |
| 25      | 24                               | 1050                     | 27                         | 2145                     | 22                          |
| 26      | 24                               | 2255                     | 27                         | 1920                     | 23                          |
| 27      | 44                               | 2355                     | 102                        | 100                      | 26                          |
| 28      | 420                              | 2335                     | 833                        | 2400                     | 102                         |
| 29      | 781                              | 0715                     | 874                        | 2355                     | 595                         |
| 30      | 516                              | 2350                     | 960                        | 1125                     | 428                         |
| 31      | 1100                             | 2355                     | 2004                       | 1900                     | 874                         |
| TOTAL   | 3596                             | - - -                    | - - -                      | - - -                    | - - -                       |
| AVERAGE | 116                              | 179                      |                            |                          | 87                          |
| MAXIMUM | 1100                             |                          | 2004                       |                          | 874                         |
| MINIMUM | 21                               | 22                       |                            |                          | 19                          |
| ACRE FT | 7119                             | - - -                    | - - -                      | - - -                    | - - -                       |

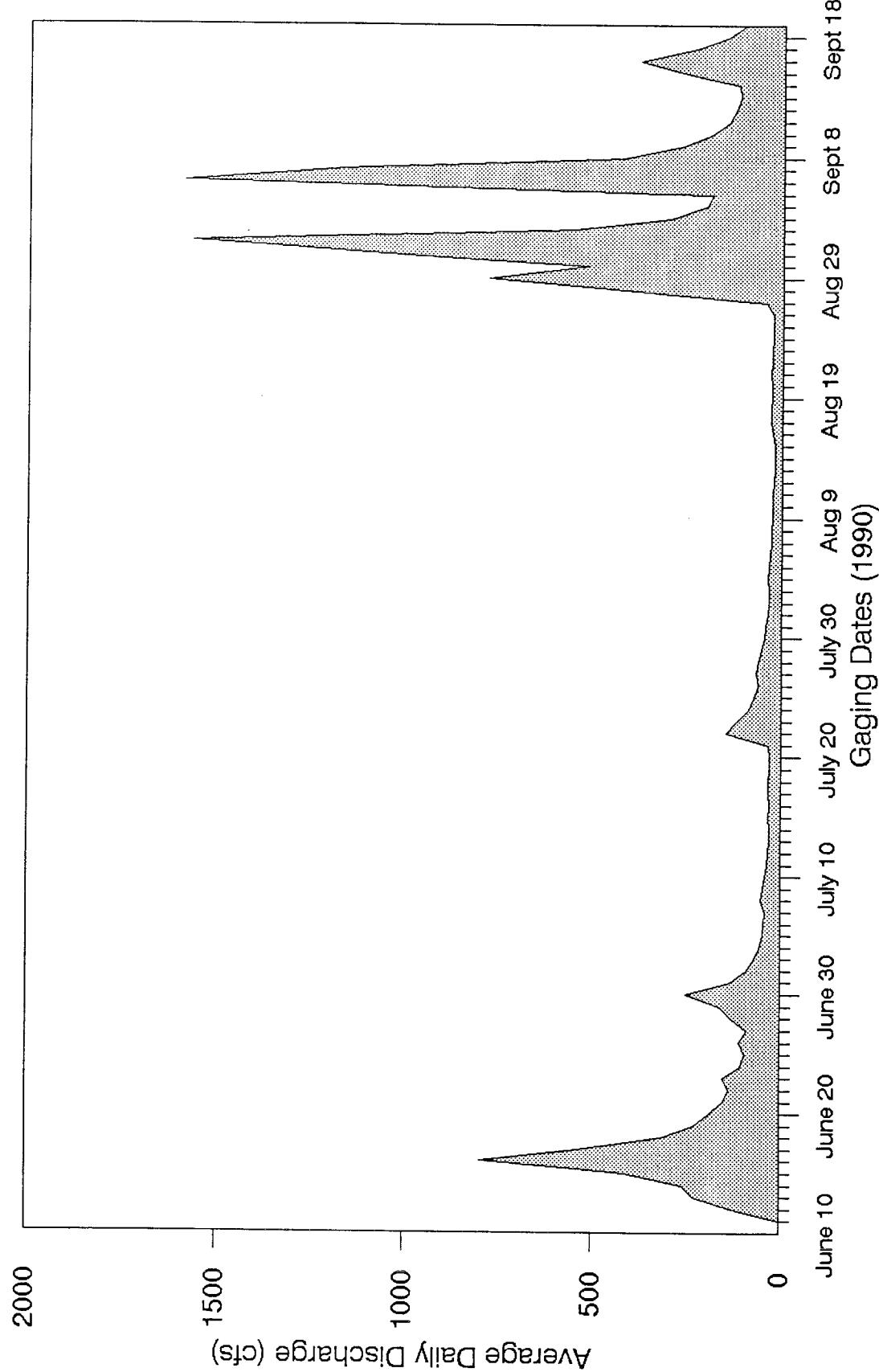
## ARCTIC NATIONAL WILDLIFE REFUGE

Tamayariak River

SEPTEMBER 1990

| DATE    | AVE.DAILY<br>DISCH.<br>CU.FT/SEC | TIME<br>OF MAX<br>DISCH. | MAX<br>DISCH.<br>CU FT/SEC | TIME<br>OF MIN<br>DISCH. | MIN<br>DISCH.<br>CU. FT/SEC |
|---------|----------------------------------|--------------------------|----------------------------|--------------------------|-----------------------------|
| 1       | 1567                             | 0130                     | 2377                       | 2345                     | 846                         |
| 2       | 555                              | 10                       | 846                        | 2345                     | 397                         |
| 3       | 300                              | 2400                     | 405                        | 2350                     | 260                         |
| 4       | 205                              | 0020                     | 260                        | 1850                     | 179                         |
| 5       | 187                              | 2355                     | 306                        | 1130                     | 167                         |
| 6       | 1588                             | 1850                     | 4099                       | 2400                     | 306                         |
| 7       | 1167                             | 0005                     | 2859                       | 2340                     | 616                         |
| 8       | 428                              | 0015                     | 638                        | 2350                     | 319                         |
| 9       | 271                              | 2400                     | 319                        | 2355                     | 219                         |
| 10      | 192                              | 1505                     | 238                        | 0855                     | 160                         |
| 11      | 146                              | 0005                     | 175                        | 0800                     | 127                         |
| 12      | 127                              | 2400                     | 139                        | 1820                     | 118                         |
| 13      | 115                              | 1505                     | 127                        | 1005                     | 102                         |
| 14      | 118                              | 2355                     | 133                        | 0745                     | 115                         |
| 15      | 260                              | 2345                     | 462                        | 2400                     | 136                         |
| 16      | 382                              | 0050                     | 471                        | 2340                     | 332                         |
| 17      | 233                              | 0005                     | 332                        | 2350                     | 192                         |
| 18      | 149                              | 1735                     | 209                        | 1235                     | 118                         |
| 19      | 102                              | 2400                     | 143                        | 1210                     | 73                          |
| 20      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 21      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 22      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 23      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 24      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 25      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 26      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 27      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 28      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 29      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 30      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| TOTAL   | 8092                             | - - -                    | - - -                      | - - -                    | - - -                       |
| AVERAGE | 426                              |                          | 765                        |                          | 252                         |
| MAXIMUM | 1588                             |                          | 4099                       |                          | 846                         |
| MINIMUM | 102                              |                          | 127                        |                          | 73                          |
| ACRE FT | 16023                            |                          | - - -                      |                          | - - -                       |

Tamayariak River Gaging Station  
1990



## ARCTIC NATIONAL WILDLIFE REFUGE

## TAMAYARIK RIVER, LOWER WEST FORK

LOCATION.--Lat 69°58'50", long 145°47'40", NWNWsec 12, T.7N., R.25E., 1.5 miles upstream from the confluence with the Tamayariak River, 54 miles west-southwest of Kaktovik, Alaska.

DRAINAGE AREA.--98.14 mi<sup>2</sup>, of which 5.55 mi<sup>2</sup> are located within the Arctic National Wildlife Refuge Wilderness Area.

PERIOD OF RECORD.--July to Sept. 1988; June to Sept. 1989; June to Sept. 1990.

REMARKS.--This is a 4th Order drainage. Discharge records are initiated during break-up and discontinued at freeze-up of each year.

EXTREMES.--Maximum Discharge, 647 cfs Aug. 21, 1989 @ 0225; Minimum Discharge, 9.0 cfs August 6 & 7, 1988.

## JUNE 1990

| DATE    | AVE.DAILY<br>DISCH.<br>CU.FT/SEC | TIME<br>OF MAX<br>DISCH. | MAX<br>DISCH.<br>CU FT/SEC | TIME<br>OF MIN<br>DISCH. | MIN<br>DISCH.<br>CU. FT/SEC |
|---------|----------------------------------|--------------------------|----------------------------|--------------------------|-----------------------------|
| 1       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 2       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 3       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 4       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 5       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 6       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 7       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 8       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 9       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 10      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 11      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 12      | 39.6                             | 2313                     | 56.1                       | 0838                     | 34.2                        |
| 13      | 46.7                             | 0003                     | 54.9                       | 0838                     | 40.6                        |
| 14      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 15      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 16      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 17      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 18      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 19      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 20      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 21      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 22      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 23      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 24      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 25      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 26      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 27      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 28      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 29      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 30      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| TOTAL   | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| AVERAGE | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| MAXIMUM | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| MINIMUM | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| ACRE FT | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |

ARCTIC NATIONAL WILDLIFE REFUGE  
TAMAYARIK RIVER, LOWER WEST FORK

JULY 1990

| DATE    | AVE.DAILY<br>DISCH.<br>CU.FT/SEC | TIME<br>OF MAX<br>DISCH. | MAX<br>DISCH.<br>CU FT/SEC | TIME<br>OF MIN<br>DISCH. | MIN<br>DISCH.<br>CU. FT/SEC |
|---------|----------------------------------|--------------------------|----------------------------|--------------------------|-----------------------------|
| 1       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 2       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 3       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 4       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 5       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 6       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 7       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 8       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 9       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 10      | 18.0                             | 1331                     | 19.1                       | 2106                     | 17.5                        |
| 11      | 17.5                             | 1616                     | 17.5                       | 2341                     | 16.0                        |
| 12      | 16.0                             | 1021                     | 16.5                       | 2226                     | 15.1                        |
| 13      | 14.6                             | 0141                     | 15.1                       | 1046                     | 13.7                        |
| 14      | 14.2                             | 0021                     | 14.6                       | 2021                     | 12.9                        |
| 15      | 13.7                             | 0246                     | 14.6                       | 2356                     | 12.5                        |
| 16      | 12.1                             | 1546                     | 12.9                       | 2356                     | 10.9                        |
| 17      | 11.7                             | 1206                     | 13.3                       | 0106                     | 10.9                        |
| 18      | 11.3                             | 1636                     | 12.1                       | 2351                     | 10.5                        |
| 19      | 10.5                             | 1556                     | 11.3                       | 1151                     | 9.8                         |
| 20      | 10.1                             | 1431                     | 10.9                       | 0716                     | 9.1                         |
| 21      | 10.5                             | 1956                     | 12.5                       | 0451                     | 8.7                         |
| 22      | 11.7                             | 0701                     | 12.9                       | 1816                     | 10.1                        |
| 23      | 10.1                             | 1616                     | 10.9                       | 1201                     | 9.1                         |
| 24      | 8.4                              | 0006                     | 9.4                        | 2111                     | 7.7                         |
| 25      | 8.7                              | 1321                     | 9.1                        | 2101                     | 8.0                         |
| 26      | 8.0                              | 2006                     | 8.7                        | 1546                     | 7.0                         |
| 27      | 7.7                              | 0011                     | 8.4                        | 2351                     | 7.0                         |
| 28      | 7.0                              | 1336                     | 7.4                        | 1836                     | 7.0                         |
| 29      | 7.0                              | 1226                     | 7.4                        | 1951                     | 6.7                         |
| 30      | 6.4                              | 1221                     | 7.0                        | 2211                     | 5.5                         |
| 31      | 6.1                              | 0506                     | 6.7                        | 2026                     | 5.5                         |
| TOTAL   | 241.6                            | - - -                    | - - -                      | - - -                    | - - -                       |
| AVERAGE | 11.0                             |                          | 11.7                       |                          | 10.1                        |
| MAXIMUM | 18.0                             |                          | 19.1                       |                          | 17.5                        |
| MINIMUM | 6.1                              |                          | 6.7                        |                          | 5.5                         |
| ACRE FT | 478.3                            | - - -                    | - - -                      | - - -                    | - - -                       |

ARCTIC NATIONAL WILDLIFE REFUGE  
TAMAYARIK RIVER, LOWER WEST FORK

AUGUST 1990

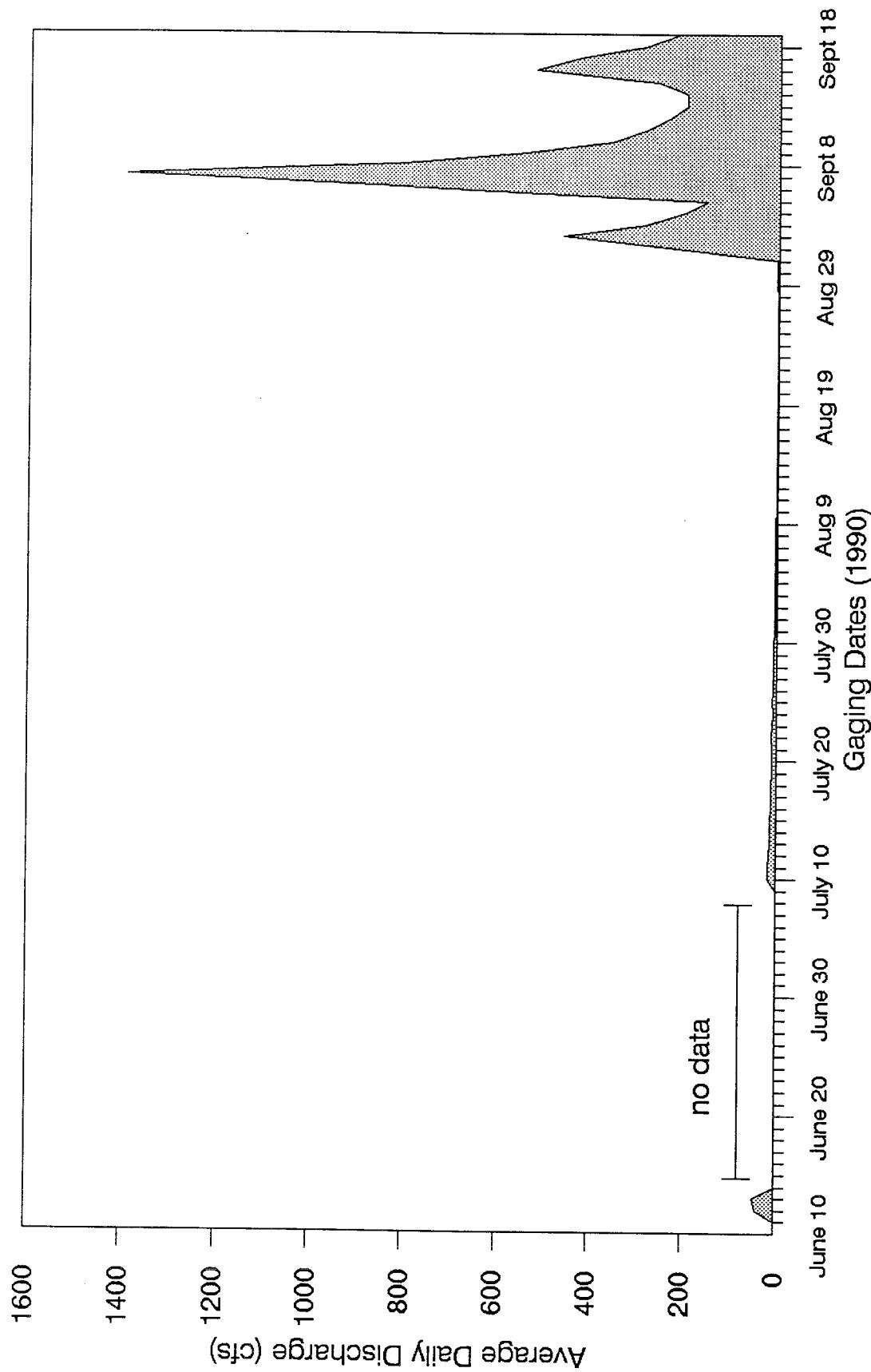
| DATE    | AVE.DAILY<br>DISCH.<br>CU.FT/SEC | TIME<br>OF MAX<br>DISCH. | MAX<br>DISCH.<br>CU FT/SEC | TIME<br>OF MIN<br>DISCH. | MIN<br>DISCH.<br>CU. FT/SEC |
|---------|----------------------------------|--------------------------|----------------------------|--------------------------|-----------------------------|
| 1       | 6.1                              | 0331                     | 6.4                        | 2351                     | 5.8                         |
| 2       | 5.8                              | 1546                     | 6.4                        | 1131                     | 5.5                         |
| 3       | 5.5                              | 1251                     | 5.8                        | 0531                     | 5.2                         |
| 4       | 5.2                              | 1136                     | 5.5                        | 0536                     | 4.6                         |
| 5       | 5.2                              | 1531                     | 5.8                        | 2226                     | 4.0                         |
| 6       | 4.9                              | 1316                     | 5.2                        | 0001                     | 4.6                         |
| 7       | 4.6                              | 0001                     | 4.9                        | 2246                     | 4.0                         |
| 8       | 4.6                              | 1316                     | 4.6                        | 0006                     | 4.3                         |
| 9       | 4.6                              | 1731                     | 4.9                        | 0346                     | 4.3                         |
| 10      | 4.3                              | 1421                     | 4.6                        | 2356                     | 3.7                         |
| 11      | 3.7                              | 1606                     | 4.0                        | 1936                     | 3.4                         |
| 12      | 3.7                              | 1621                     | 4.0                        | 0521                     | 3.7                         |
| 13      | 3.4                              | 0001                     | 3.7                        | 1346                     | 2.8                         |
| 14      | 3.4                              | 0331                     | 4.0                        | 1501                     | 2.8                         |
| 15      | 3.1                              | 0046                     | 3.7                        | 2101                     | 2.5                         |
| 16      | 3.1                              | 0201                     | 3.7                        | 2246                     | 2.8                         |
| 17      | 3.1                              | 2356                     | 3.4                        | 1536                     | 2.5                         |
| 18      | 3.1                              | 0106                     | 3.7                        | 2346                     | 3.1                         |
| 19      | 2.8                              | 1106                     | 3.4                        | 2141                     | 2.5                         |
| 20      | 2.8                              | 0146                     | 3.4                        | 2036                     | 2.2                         |
| 21      | 2.5                              | 0146                     | 3.1                        | 2151                     | 1.6                         |
| 22      | 2.2                              | 0116                     | 3.1                        | 1141                     | 1.6                         |
| 23      | 2.5                              | 0246                     | 2.8                        | 2326                     | 1.9                         |
| 24      | 2.2                              | 2346                     | 2.8                        | 1431                     | 1.3                         |
| 25      | 2.5                              | 2036                     | 2.8                        | 1406                     | 1.6                         |
| 26      | 2.2                              | 2131                     | 3.1                        | 1341                     | 1.6                         |
| 27      | 2.8                              | 2356                     | 3.4                        | 0351                     | 2.2                         |
| 28      | 3.7                              | 2341                     | 4.0                        | 0401                     | 3.1                         |
| 29      | 4.6                              | 1521                     | 4.9                        | 0146                     | 4.0                         |
| 30      | 4.6                              | 0131                     | 4.9                        | 2326                     | 4.0                         |
| 31      | 5.5                              | 2356                     | 8.7                        | 0231                     | 4.3                         |
| TOTAL   | 117.6                            | - - -                    | - - -                      | - - -                    | - - -                       |
| AVERAGE | 3.8                              | 4.3                      | 4.3                        | 4.3                      | 3.3                         |
| MAXIMUM | 6.1                              | 8.7                      | 8.7                        | 8.7                      | 5.8                         |
| MINIMUM | 2.2                              | 2.8                      | 2.8                        | 2.8                      | 1.3                         |
| ACRE FT | 232.9                            | - - -                    | - - -                      | - - -                    | - - -                       |

ARCTIC NATIONAL WILDLIFE REFUGE  
TAMAYARIAK RIVER, LOWER WEST FORK

SEPTEMBER 1990

| DATE    | AVE.DAILY<br>DISCH.<br>CU.FT/SEC | TIME<br>OF MAX<br>DISCH. | MAX<br>DISCH.<br>CU FT/SEC | TIME<br>OF MIN<br>DISCH. | MIN<br>DISCH.<br>CU. FT/SEC |
|---------|----------------------------------|--------------------------|----------------------------|--------------------------|-----------------------------|
| 1       | 219.1                            | 1226                     | 766.9                      | 0001                     | 8.7                         |
| 2       | 460.5                            | 0006                     | 640.2                      | 2341                     | 347.7                       |
| 3       | 284.4                            | 0006                     | 362.5                      | 2316                     | 240.8                       |
| 4       | 202.2                            | 0001                     | 240.8                      | 2356                     | 168.3                       |
| 5       | 154.3                            | 0036                     | 171.2                      | 2336                     | 143.8                       |
| 6       | 758.5                            | 2246                     | 2455.1                     | 0006                     | 143.8                       |
| 7       | 1396.0                           | 0016                     | 2436.5                     | 2356                     | 1018.3                      |
| 8       | 827.4                            | 0001                     | 1081.0                     | 2336                     | 670.4                       |
| 9       | 541.9                            | 0006                     | 685.8                      | 1946                     | 460.5                       |
| 10      | 357.5                            | 0006                     | 472.4                      | 1616                     | 301.6                       |
| 11      | 280.2                            | 0211                     | 367.5                      | 2351                     | 222.6                       |
| 12      | 233.4                            | 0656                     | 252.2                      | 2001                     | 215.7                       |
| 13      | 198.9                            | 0001                     | 222.6                      | 1301                     | 183.1                       |
| 14      | 198.9                            | 2131                     | 212.2                      | 1026                     | 189.3                       |
| 15      | 260.0                            | 2351                     | 404.0                      | 0511                     | 198.9                       |
| 16      | 522.3                            | 0731                     | 603.7                      | 0006                     | 404.0                       |
| 17      | 426.0                            | 0016                     | 589.6                      | 2116                     | 314.9                       |
| 18      | 288.6                            | 0151                     | 398.6                      | 2346                     | 202.2                       |
| 19      | 212.2                            | 0551                     | 244.5                      | 2326                     | 180.1                       |
| 20      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 21      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 22      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 23      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 24      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 25      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 26      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 27      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 28      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 29      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 30      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| TOTAL   | 7822.3                           | - - -                    | - - -                      | - - -                    | - - -                       |
| AVERAGE | 411.7                            |                          | 663.5                      |                          | 295.5                       |
| MAXIMUM | 1396.0                           |                          | 2455.1                     |                          | 1018.3                      |
| MINIMUM | 154.3                            |                          | 171.2                      |                          | 8.7                         |
| ACRE FT | 15488.1                          |                          | - - -                      |                          | - - -                       |

Lower West Fork Tamayariak River  
1990



## ARCTIC NATIONAL WILDLIFE REFUGE

## Tamayariak River, Middle Fork

LOCATION.-Lat 69°58'33", long 145°46'44", in center sec 12, T.7N., R.25E., 0.4 miles upstream from the confluence with the West Fork Tamayariak River, 54 miles west-southwest of Kaktovik, Alaska.

DRAINAGE AREA.-61.3 mi<sup>2</sup>, of which 0.79 mi<sup>2</sup> are located within the Arctic National Wildlife Wilderness Area.

PERIOD OF RECORD.--July to Sept. 1988; June to Sept. 1989; June to Sept. 1990.

REMARKS.-This is a 4th Order drainage. Discharge records are initiated during break-up and discontinued at freeze-up of each year.

EXTREMES FOR PERIOD OF RECORD.-Maximum Discharge, 636.9 cfs Sept. 6, 1990 @ 1924 hrs; Minimum Discharge, 0.1 cfs Sept. 19, 1990 @ 2359 hrs.

## JUNE 1990

|         | AVE.DAILY<br>DISCH.<br>CU.FT/SEC | TIME<br>OF MAX<br>DISCH. | MAX<br>DISCH.<br>CU FT/SEC | TIME<br>OF MIN<br>DISCH. | MIN<br>DISCH.<br>CU. FT/SEC |
|---------|----------------------------------|--------------------------|----------------------------|--------------------------|-----------------------------|
| DATE    |                                  |                          |                            |                          |                             |
| 1       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 2       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 3       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 4       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 5       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 6       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 7       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 8       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 9       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 10      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 11      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 12      | 26.3                             | 2355                     | 44.2                       | 0005                     | 23.3                        |
| 13      | 41.0                             | 2255                     | 47.6                       | 1440                     | 35.9                        |
| 14      | 39.9                             | 2350                     | 59.0                       | 1420                     | 34.0                        |
| 15      | 44.2                             | 10                       | 59.0                       | 1500                     | 36.9                        |
| 16      | 43.1                             | 2350                     | 51.2                       | 1200                     | 39.9                        |
| 17      | 53.7                             | 2355                     | 60.3                       | 2400                     | 51.2                        |
| 18      | 50.0                             | 0055                     | 61.7                       | 1450                     | 43.1                        |
| 19      | 44.2                             | 0055                     | 53.7                       | 1520                     | 37.9                        |
| 20      | 37.9                             | 0040                     | 47.6                       | 1720                     | 33.1                        |
| 21      | 78.3                             | 1905                     | 155.8                      | 1100                     | 30.4                        |
| 22      | 150.6                            | 1505                     | 169.1                      | 0545                     | 138.3                       |
| 23      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 24      | 23.3                             | 2324                     | 24.8                       | 1549                     | 21.9                        |
| 25      | 22.6                             | 2354                     | 27.1                       | 1639                     | 19.2                        |
| 26      | 21.9                             | 0104                     | 27.1                       | 1624                     | 18.0                        |
| 27      | 19.8                             | 0104                     | 24.0                       | 1834                     | 16.8                        |
| 28      | 16.2                             | 0139                     | 19.2                       | 1829                     | 14.0                        |
| 29      | 14.6                             | 0214                     | 16.8                       | 1729                     | 12.6                        |
| 30      | 12.1                             | 0504                     | 13.5                       | 1924                     | 9.9                         |
| TOTAL   | 739.8                            | - - -                    | - - -                      | - - -                    | - - -                       |
| AVERAGE | 46.2                             |                          | 51.0                       |                          | 33.0                        |
| MAXIMUM | 150.6                            |                          | 169.1                      |                          | 138.3                       |
| MINIMUM | 12.1                             |                          | 13.5                       |                          | 9.9                         |
| ACRE FT | 1464.8                           | - - -                    | - - -                      | - - -                    | - - -                       |

ARCTIC NATIONAL WILDLIFE REFUGE  
Tamayariak River, Middle Fork

JULY 1990

| DATE    | AVE.DAILY<br>DISCH.<br>CU.FT/SEC | TIME<br>OF MAX<br>DISCH. | MAX<br>DISCH.<br>CU FT/SEC | TIME<br>OF MIN<br>DISCH. | MIN<br>DISCH.<br>CU. FT/SEC |
|---------|----------------------------------|--------------------------|----------------------------|--------------------------|-----------------------------|
| 1       | 10.7                             | 0424                     | 13.0                       | 2024                     | 8.7                         |
| 2       | 9.5                              | 0514                     | 11.6                       | 2044                     | 7.3                         |
| 3       | 9.1                              | 0459                     | 11.6                       | 2159                     | 6.7                         |
| 4       | 7.3                              | 0719                     | 8.7                        | 2134                     | 5.8                         |
| 5       | 6.4                              | 0659                     | 7.3                        | 2124                     | 5.0                         |
| 6       | 5.8                              | 0739                     | 7.0                        | 2319                     | 4.5                         |
| 7       | 5.2                              | 2344                     | 7.0                        | 0014                     | 4.5                         |
| 8       | 7.0                              | 0404                     | 8.4                        | 2359                     | 6.1                         |
| 9       | 5.2                              | 0054                     | 6.1                        | 2314                     | 4.7                         |
| 10      | 4.5                              | 0524                     | 5.0                        | 2034                     | 4.0                         |
| 11      | 4.0                              | 0949                     | 4.5                        | 2324                     | 3.4                         |
| 12      | 3.4                              | 0904                     | 3.6                        | 2354                     | 2.8                         |
| 13      | 2.8                              | 0734                     | 3.0                        | 2044                     | 2.5                         |
| 14      | 2.5                              | 0914                     | 2.8                        | 2219                     | 2.0                         |
| 15      | 2.0                              | 0819                     | 2.8                        | 2109                     | 1.6                         |
| 16      | 1.9                              | 1014                     | 2.2                        | 0019                     | 1.8                         |
| 17      | 2.0                              | 1559                     | 2.2                        | 0314                     | 1.8                         |
| 18      | 1.8                              | 0004                     | 2.0                        | 1904                     | 1.5                         |
| 19      | 1.5                              | 1259                     | 1.6                        | 1659                     | 1.4                         |
| 20      | 1.4                              | 0614                     | 1.6                        | 1809                     | 1.3                         |
| 21      | 1.6                              | 2359                     | 2.3                        | 0324                     | 1.3                         |
| 22      | 2.5                              | 0644                     | 3.0                        | 2359                     | 2.0                         |
| 23      | 1.8                              | 0954                     | 2.0                        | 2229                     | 1.3                         |
| 24      | 1.3                              | 0759                     | 1.4                        | 2219                     | 1.2                         |
| 25      | 1.2                              | 0654                     | 1.3                        | 2134                     | 1.1                         |
| 26      | 1.2                              | 0949                     | 1.4                        | 2154                     | 1.1                         |
| 27      | 1.1                              | 0814                     | 1.2                        | 1809                     | 1.0                         |
| 28      | 1.0                              | 1049                     | 1.1                        | 1954                     | 0.8                         |
| 29      | 0.9                              | 1149                     | 1.1                        | 1909                     | 0.8                         |
| 30      | 0.9                              | 0839                     | 1.0                        | 1959                     | 0.7                         |
| 31      | 0.8                              | 0854                     | 0.9                        | 2014                     | 0.7                         |
| TOTAL   | 108.3                            | - - -                    | - - -                      | - - -                    | - - -                       |
| AVERAGE | 3.5                              |                          | 4.2                        |                          | 2.9                         |
| MAXIMUM | 10.7                             |                          | 13.0                       |                          | 8.7                         |
| MINIMUM | 0.8                              |                          | 0.9                        |                          | 0.7                         |
| ACRE FT | 214.4                            | - - -                    | - - -                      | - - -                    | - - -                       |

ARCTIC NATIONAL WILDLIFE REFUGE  
Tamayariak River, Middle Fork

AUGUST 1990

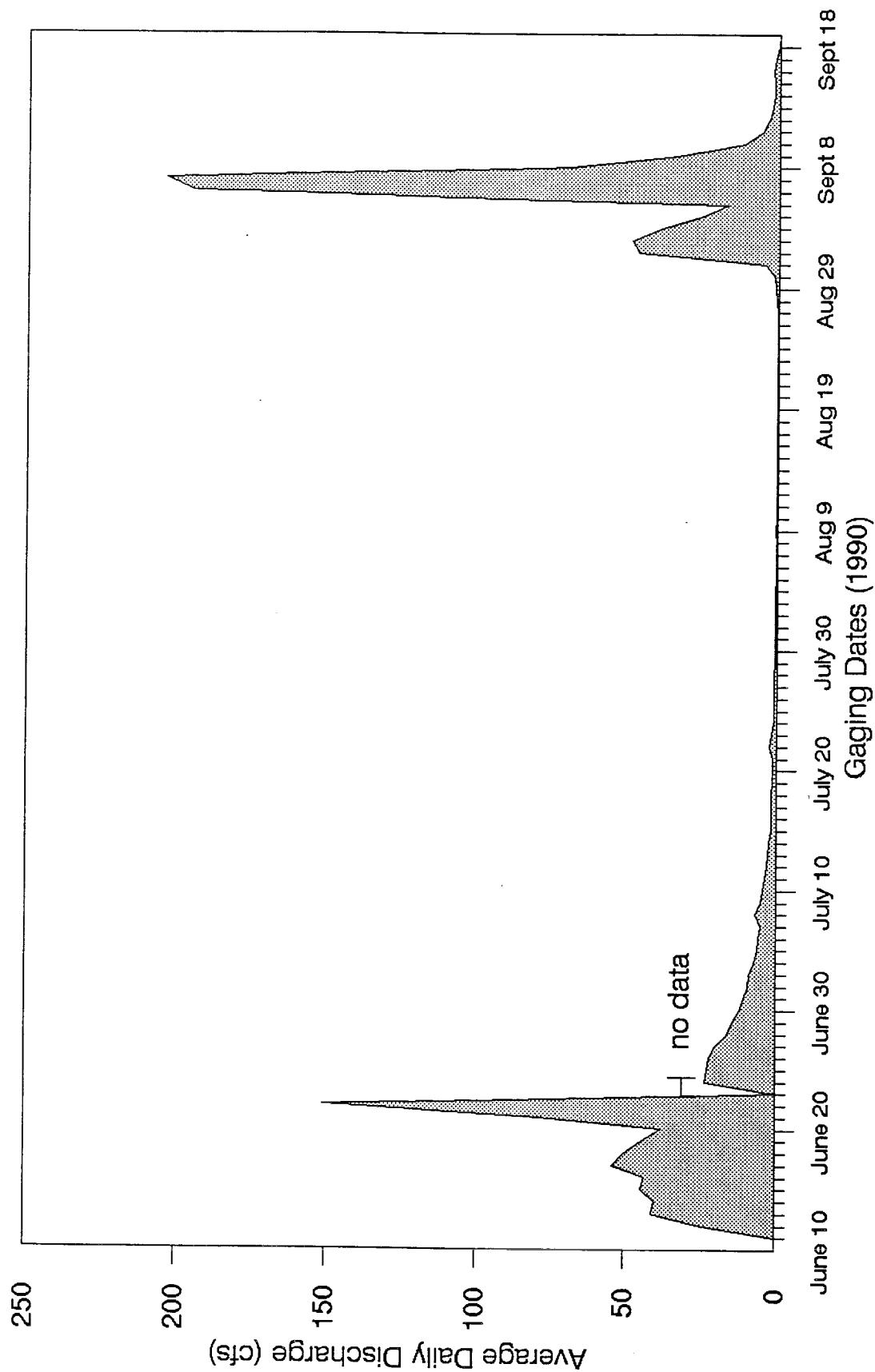
| DATE    | AVE.DAILY<br>DISCH.<br>CU.FT/SEC | TIME<br>OF MAX<br>DISCH. | MAX<br>DISCH.<br>CU FT/SEC | TIME<br>OF MIN<br>DISCH. | MIN<br>DISCH.<br>CU. FT/SEC |
|---------|----------------------------------|--------------------------|----------------------------|--------------------------|-----------------------------|
| 1       | 0.8                              | 0859                     | 0.9                        | 2339                     | 0.8                         |
| 2       | 0.7                              | 1019                     | 0.9                        | 1904                     | 0.6                         |
| 3       | 0.7                              | 1224                     | 0.7                        | 0004                     | 0.6                         |
| 4       | 0.7                              | 0844                     | 0.8                        | 1829                     | 0.7                         |
| 5       | 0.7                              | 0549                     | 0.8                        | 2124                     | 0.5                         |
| 6       | 0.6                              | 0809                     | 0.7                        | 0059                     | 0.5                         |
| 7       | 0.7                              | 1234                     | 0.7                        | 0004                     | 0.6                         |
| 8       | 0.7                              | 1019                     | 0.7                        | 0019                     | 0.6                         |
| 9       | 0.7                              | 1214                     | 0.7                        | 2229                     | 0.7                         |
| 10      | 0.7                              | 1114                     | 0.7                        | 2239                     | 0.7                         |
| 11      | 0.7                              | 1014                     | 0.7                        | 2219                     | 0.6                         |
| 12      | 0.7                              | 0949                     | 0.7                        | 2259                     | 0.6                         |
| 13      | 0.5                              | 1114                     | 0.6                        | 2354                     | 0.4                         |
| 14      | 0.5                              | 0729                     | 0.5                        | 1909                     | 0.4                         |
| 15      | 0.4                              | 1229                     | 0.5                        | 2034                     | 0.4                         |
| 16      | 0.5                              | 1019                     | 0.5                        | 0049                     | 0.4                         |
| 17      | 0.5                              | 1214                     | 0.5                        | 1819                     | 0.4                         |
| 18      | 0.5                              | 1259                     | 0.5                        | 0104                     | 0.4                         |
| 19      | 0.5                              | 0724                     | 0.5                        | 1554                     | 0.4                         |
| 20      | 0.5                              | 1044                     | 0.6                        | 0019                     | 0.5                         |
| 21      | 0.5                              | 1309                     | 0.6                        | 2254                     | 0.5                         |
| 22      | 0.5                              | 1209                     | 0.6                        | 2159                     | 0.5                         |
| 23      | 0.5                              | 1124                     | 0.6                        | 1829                     | 0.5                         |
| 24      | 0.5                              | 1849                     | 0.6                        | 1534                     | 0.5                         |
| 25      | 0.5                              | 1059                     | 0.6                        | 2034                     | 0.4                         |
| 26      | 0.5                              | 1259                     | 0.7                        | 1249                     | 0.4                         |
| 27      | 0.6                              | 1419                     | 0.7                        | 1954                     | 0.5                         |
| 28      | 0.9                              | 1224                     | 1.1                        | 0009                     | 0.7                         |
| 29      | 1.3                              | 1724                     | 1.5                        | 0224                     | 1.0                         |
| 30      | 1.5                              | 2359                     | 2.2                        | 0409                     | 1.4                         |
| 31      | 4.7                              | 1759                     | 33.1                       | 0004                     | 2.2                         |
| TOTAL   | 24.2                             | - - -                    | - - -                      | - - -                    | - - -                       |
| AVERAGE | 0.8                              |                          | 1.8                        |                          | 0.6                         |
| MAXIMUM | 4.7                              |                          | 33.1                       |                          | 2.2                         |
| MINIMUM | 0.4                              |                          | 0.5                        |                          | 0.4                         |
| ACRE FT | 48.0                             | - - -                    | - - -                      | - - -                    | - - -                       |

ARCTIC NATIONAL WILDLIFE REFUGE  
Tamayariak River, Middle Fork

SEPTEMBER 1990

| DATE    | AVE.DAILY<br>DISCH.<br>CU.FT/SEC | TIME<br>OF MAX<br>DISCH. | MAX<br>DISCH.<br>CU FT/SEC | TIME<br>OF MIN<br>DISCH. | MIN<br>DISCH.<br>CU. FT/SEC |
|---------|----------------------------------|--------------------------|----------------------------|--------------------------|-----------------------------|
| 1       | 46.5                             | 1504                     | 68.9                       | 0004                     | 14.0                        |
| 2       | 48.8                             | 0004                     | 59.0                       | 2359                     | 44.2                        |
| 3       | 38.9                             | 1504                     | 44.2                       | 2354                     | 32.2                        |
| 4       | 25.5                             | 0004                     | 32.2                       | 2359                     | 18.0                        |
| 5       | 17.4                             | 2349                     | 20.5                       | 0724                     | 14.0                        |
| 6       | 194.9                            | 1924                     | 636.9                      | 0004                     | 20.5                        |
| 7       | 204.0                            | 0009                     | 431.8                      | 2359                     | 101.6                       |
| 8       | 68.9                             | 0004                     | 101.6                      | 2359                     | 56.3                        |
| 9       | 34.0                             | 0009                     | 56.3                       | 2359                     | 20.5                        |
| 10      | 11.6                             | 0004                     | 21.2                       | 2359                     | 8.4                         |
| 11      | 5.5                              | 0004                     | 8.4                        | 0839                     | 3.6                         |
| 12      | 3.6                              | 1334                     | 4.7                        | 2359                     | 2.6                         |
| 13      | 2.6                              | 1639                     | 3.8                        | 0814                     | 1.9                         |
| 14      | 2.0                              | 1634                     | 3.0                        | 0814                     | 1.4                         |
| 15      | 1.9                              | 1744                     | 2.8                        | 0759                     | 1.1                         |
| 16      | 2.2                              | 1519                     | 3.6                        | 2329                     | 1.5                         |
| 17      | 1.4                              | 1529                     | 1.9                        | 2334                     | 0.9                         |
| 18      | 0.7                              | 1644                     | 1.2                        | 2359                     | 0.3                         |
| 19      | 0.3                              | 1514                     | 0.5                        | 2359                     | 0.1                         |
| 20      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 21      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 22      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 23      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 24      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 25      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 26      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 27      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 28      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 29      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 30      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| TOTAL   | 710.8                            | - - -                    | - - -                      | - - -                    | - - -                       |
| AVERAGE | 37.4                             |                          | 79.1                       |                          | 18.1                        |
| MAXIMUM | 204.0                            |                          | 636.9                      |                          | 101.6                       |
| MINIMUM | 0.3                              |                          | 0.5                        |                          | 0.1                         |
| ACRE FT | 1407.3                           |                          | - - -                      |                          | - - -                       |

Middle Fork Tamayariak River  
1990



## ARCTIC NATIONAL WILDLIFE REFUGE

## TAMAYARIAK RIVER, UPPER WEST FORK

LOCATION.--Lat 69°49'58", long 145°55'15", in the center W½W½ sec 33, T.6N., R.25E., 13.9 miles upstream from the confluence with the Tamayariak River, 61.1 miles west-southwest of Kaktovik, Alaska.

DRAINAGE AREA.--49.2 mi<sup>2</sup>, of which 5.6 mi<sup>2</sup> are located within the Arctic National Wildlife Refuge Wilderness Area.

PERIOD OF RECORD.--July to Sept. 1988; June to Sept. 1989; June to Sept. 1990.

REMARKS.--This is a 4th Order drainage. Discharge records are initiated during break-up and discontinued at freeze-up of each year.

EXTREMES FOR PERIOD OF RECORD.--Maximum Discharge, 404 cfs Aug 13, 1988 @ 0315 hrs; Minimum Discharge, 0.0 cfs July 9-10, & 13, 1989, July 16-21, 1990, July 31 to August 19, 1990.

## JUNE 1990

| DATE    | AVE.DAILY<br>DISCH.<br>CU.FT/SEC | TIME<br>OF MAX<br>DISCH. | MAX<br>DISCH.<br>CU FT/SEC | TIME<br>OF MIN<br>DISCH. | MIN<br>DISCH.<br>CU. FT/SEC |
|---------|----------------------------------|--------------------------|----------------------------|--------------------------|-----------------------------|
| 1       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 2       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 3       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 4       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 5       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 6       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 7       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 8       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 9       | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 10      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 11      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 12      | 24.6                             | 2103                     | 49.2                       | 0043                     | 18.1                        |
| 13      | 35.2                             | 0003                     | 45.0                       | 1233                     | 30.0                        |
| 14      | 30.0                             | 2023                     | 53.6                       | 1208                     | 21.5                        |
| 15      | 34.2                             | 2358                     | 95.8                       | 1433                     | 20.1                        |
| 16      | 129.8                            | 2123                     | 171.5                      | 0003                     | 98.2                        |
| 17      | 129.8                            | 0008                     | 148.0                      | 2358                     | 89.0                        |
| 18      | 68.7                             | 0008                     | 86.8                       | 2358                     | 52.1                        |
| 19      | 39.9                             | 0003                     | 52.1                       | 2358                     | 31.0                        |
| 20      | 27.2                             | 0003                     | 31.0                       | 2358                     | 20.1                        |
| 21      | 18.1                             | 0043                     | 20.1                       | 2348                     | 15.2                        |
| 22      | 15.2                             | 1703                     | 16.9                       | 2358                     | 13.7                        |
| 23      | 11.1                             | 0003                     | 13.7                       | 2358                     | 9.3                         |
| 24      | 8.7                              | 1923                     | 9.3                        | 2318                     | 7.6                         |
| 25      | 8.7                              | 1913                     | 10.7                       | 0318                     | 7.6                         |
| 26      | 7.6                              | 0003                     | 8.7                        | 2353                     | 6.5                         |
| 27      | 6.2                              | 0213                     | 6.5                        | 2313                     | 5.1                         |
| 28      | 6.0                              | 0918                     | 6.9                        | 0248                     | 5.1                         |
| 29      | 7.2                              | 1438                     | 8.7                        | 0023                     | 6.2                         |
| 30      | 6.7                              | 1848                     | 7.6                        | 0228                     | 6.2                         |
| TOTAL   | 615.0                            | - - -                    | - - -                      | - - -                    | - - -                       |
| AVERAGE | 32.4                             |                          | 44.3                       |                          | 24.3                        |
| MAXIMUM | 129.8                            |                          | 171.5                      |                          | 98.2                        |
| MINIMUM | 6.0                              |                          | 6.5                        |                          | 5.1                         |
| ACRE FT | 1217.7                           | - - -                    | - - -                      | - - -                    | - - -                       |

ARCTIC NATIONAL WILDLIFE REFUGE  
TAMAYARIK RIVER, UPPER WEST FORK

JULY 1990

| DATE    | AVE.DAILY<br>DISCH.<br>CU.FT/SEC | TIME<br>OF MAX<br>DISCH. | MAX<br>DISCH.<br>CU FT/SEC | TIME<br>OF MIN<br>DISCH. | MIN<br>DISCH.<br>CU. FT/SEC |
|---------|----------------------------------|--------------------------|----------------------------|--------------------------|-----------------------------|
| 1       | 6.2                              | 1248                     | 6.5                        | 2358                     | 5.1                         |
| 2       | 5.2                              | 1743                     | 5.8                        | 2358                     | 4.6                         |
| 3       | 4.2                              | 0003                     | 4.5                        | 2358                     | 3.7                         |
| 4       | 3.7                              | 1818                     | 3.8                        | 2358                     | 3.2                         |
| 5       | 3.2                              | 1818                     | 3.5                        | 2358                     | 2.9                         |
| 6       | 2.8                              | 0718                     | 3.0                        | 2358                     | 2.3                         |
| 7       | 2.1                              | 2358                     | 2.6                        | 2058                     | 1.2                         |
| 8       | 2.2                              | 1208                     | 2.7                        | 2318                     | 1.5                         |
| 9       | 1.7                              | 1558                     | 2.0                        | 2053                     | 1.2                         |
| 10      | 1.8                              | 1058                     | 2.3                        | 2358                     | 1.4                         |
| 11      | 1.8                              | 0958                     | 2.1                        | 2358                     | 1.2                         |
| 12      | 1.5                              | 1338                     | 1.8                        | 0138                     | 0.9                         |
| 13      | 1.2                              | 1013                     | 1.5                        | 0138                     | 0.5                         |
| 14      | 1.2                              | 0913                     | 1.7                        | 0108                     | 0.5                         |
| 15      | 0.9                              | 0953                     | 1.2                        | 2358                     | 0.1                         |
| 16      | 0.3                              | 0948                     | 0.7                        | 2233                     | 0.0                         |
| 17      | 0.5                              | 1303                     | 1.1                        | 0003                     | 0.0                         |
| 18      | 0.3                              | 0943                     | 0.9                        | 2338                     | 0.0                         |
| 19      | 0.0                              | 0948                     | 0.7                        | 2358                     | 0.0                         |
| 20      | 0.0                              | 1008                     | 0.5                        | 2138                     | 0.0                         |
| 21      | 0.9                              | 2353                     | 2.6                        | 0003                     | 0.0                         |
| 22      | 2.6                              | 1113                     | 3.1                        | 2358                     | 2.0                         |
| 23      | 2.3                              | 1258                     | 2.6                        | 0118                     | 1.8                         |
| 24      | 2.5                              | 1148                     | 2.9                        | 0023                     | 2.0                         |
| 25      | 2.2                              | 1123                     | 2.7                        | 2248                     | 1.4                         |
| 26      | 2.0                              | 1023                     | 2.5                        | 2358                     | 0.9                         |
| 27      | 1.4                              | 1023                     | 2.1                        | 2308                     | 0.5                         |
| 28      | 1.4                              | 1328                     | 2.0                        | 0003                     | 0.5                         |
| 29      | 1.4                              | 1238                     | 1.7                        | 2353                     | 0.3                         |
| 30      | 1.2                              | 1328                     | 1.7                        | 2358                     | 0.1                         |
| 31      | 0.9                              | 1208                     | 1.5                        | 2333                     | 0.0                         |
| TOTAL   | 59.1                             | - - -                    | - - -                      | - - -                    | - - -                       |
| AVERAGE | 1.9                              |                          | 2.4                        |                          | 1.1                         |
| MAXIMUM | 6.2                              |                          | 6.5                        |                          | 5.1                         |
| MINIMUM | 0.0                              |                          | 0.5                        |                          | 0.0                         |
| ACRE FT | 117.1                            | - - -                    | - - -                      | - - -                    | - - -                       |

ARCTIC NATIONAL WILDLIFE REFUGE  
TAMAYARIK RIVER, UPPER WEST FORK

AUGUST 1990

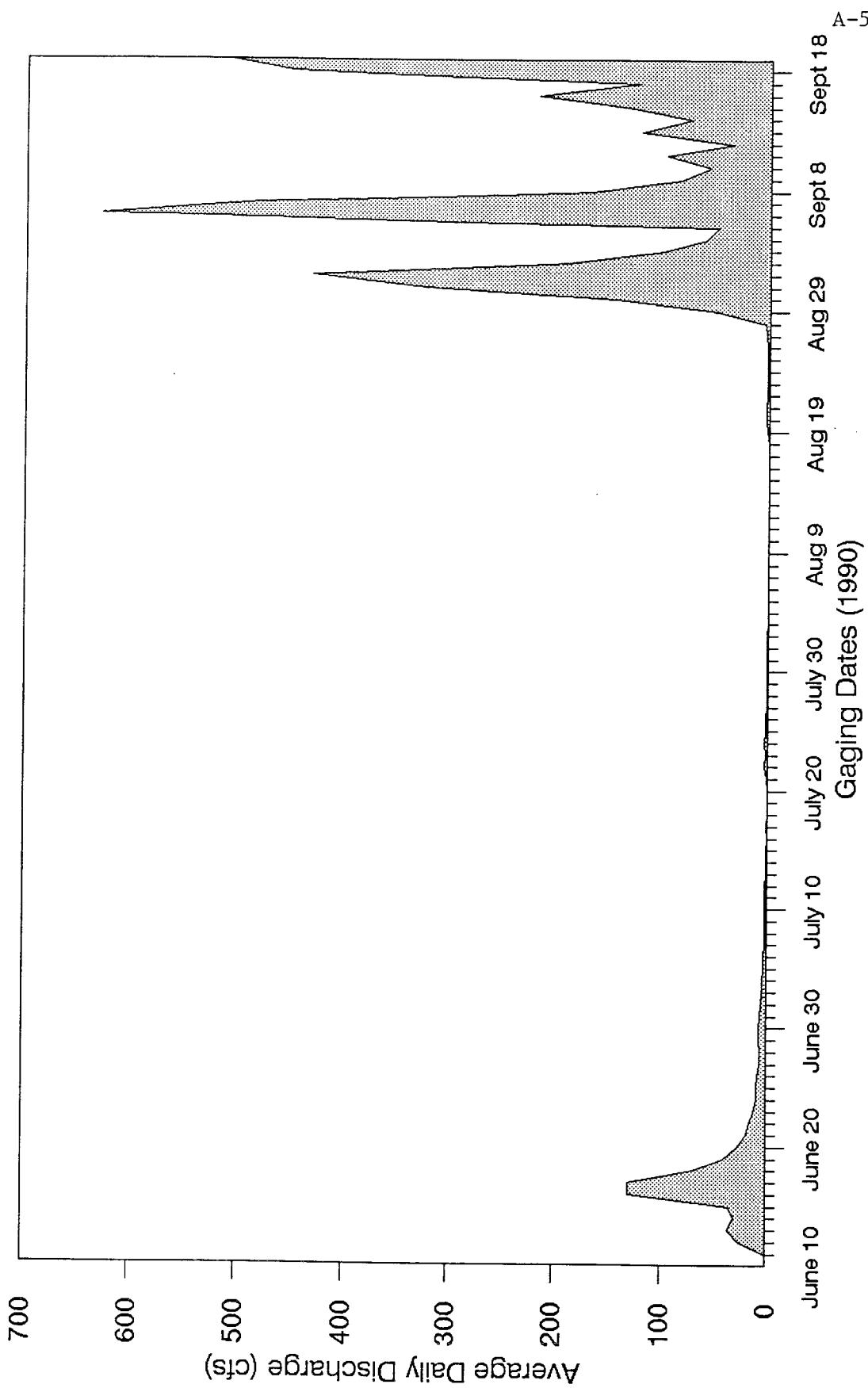
| DATE    | AVE.DAILY<br>DISCH.<br>CU.FT/SEC | TIME<br>OF MAX<br>DISCH. | MAX<br>DISCH.<br>CU FT/SEC | TIME<br>OF MIN<br>DISCH. | MIN<br>DISCH.<br>CU. FT/SEC |
|---------|----------------------------------|--------------------------|----------------------------|--------------------------|-----------------------------|
| 1       | 0.7                              | 1458                     | 1.4                        | 2358                     | 0.0                         |
| 2       | 0.5                              | 1008                     | 1.1                        | 2323                     | 0.0                         |
| 3       | 0.1                              | 1123                     | 0.9                        | 0003                     | 0.0                         |
| 4       | 0.3                              | 1228                     | 0.9                        | 2343                     | 0.0                         |
| 5       | 0.1                              | 1508                     | 1.1                        | 2353                     | 0.0                         |
| 6       | 0.0                              | 1453                     | 0.7                        | 0003                     | 0.0                         |
| 7       | 0.0                              | 1533                     | 0.3                        | 2333                     | 0.0                         |
| 8       | 0.0                              | 1348                     | 0.1                        | 0003                     | 0.0                         |
| 9       | 0.0                              | 1203                     | 0.3                        | 2228                     | 0.0                         |
| 10      | 0.0                              | 1508                     | 0.3                        | 2303                     | 0.0                         |
| 11      | 0.0                              | 1518                     | 0.5                        | 2318                     | 0.0                         |
| 12      | 0.0                              | 1558                     | 0.3                        | 2318                     | 0.0                         |
| 13      | 0.0                              | 1623                     | 0.7                        | 2248                     | 0.0                         |
| 14      | 0.0                              | 1518                     | 0.1                        | 2243                     | 0.0                         |
| 15      | 0.0                              | 1623                     | 0.1                        | 2243                     | 0.0                         |
| 16      | 0.0                              | 1718                     | 1.1                        | 0008                     | 0.0                         |
| 17      | 0.0                              | 1548                     | 0.9                        | 2233                     | 0.0                         |
| 18      | 0.0                              | 1348                     | 0.1                        | 0003                     | 0.0                         |
| 19      | 2.0                              | 1543                     | 3.2                        | 0008                     | 0.0                         |
| 20      | 2.6                              | 1613                     | 2.9                        | 0003                     | 2.1                         |
| 21      | 2.6                              | 1558                     | 3.0                        | 2258                     | 1.8                         |
| 22      | 2.3                              | 1623                     | 3.0                        | 2248                     | 1.5                         |
| 23      | 2.1                              | 1618                     | 2.9                        | 2233                     | 1.4                         |
| 24      | 1.8                              | 1848                     | 2.3                        | 2243                     | 1.2                         |
| 25      | 1.7                              | 1608                     | 2.3                        | 2223                     | 0.9                         |
| 26      | 1.5                              | 1618                     | 2.3                        | 1933                     | 1.1                         |
| 27      | 2.6                              | 1453                     | 2.9                        | 0103                     | 2.2                         |
| 28      | 3.5                              | 2358                     | 9.6                        | 0003                     | 2.7                         |
| 29      | 49.2                             | 2318                     | 105.5                      | 0003                     | 9.6                         |
| 30      | 144.8                            | 2323                     | 261.8                      | 0758                     | 103.0                       |
| 31      | 322.8                            | 2353                     | 531.6                      | 0003                     | 257.1                       |
| TOTAL   | 535.5                            | - - -                    | - - -                      | - - -                    | - - -                       |
| AVERAGE | 17.3                             | 30.5                     | 11.6                       |                          |                             |
| MAXIMUM | 322.8                            | 531.6                    | 257.1                      |                          |                             |
| MINIMUM | 0.0                              | 0.1                      | 0.0                        |                          |                             |
| ACRE FT | 1060.3                           | - - -                    | - - -                      |                          |                             |

ARCTIC NATIONAL WILDLIFE REFUGE  
TAMAYARIK RIVER, UPPER WEST FORK

SEPTEMBER 1990

| DATE    | AVE.DAILY<br>DISCH.<br>CU.FT/SEC | TIME<br>OF MAX<br>DISCH. | MAX<br>DISCH.<br>CU FT/SEC | TIME<br>OF MIN<br>DISCH. | MIN<br>DISCH.<br>CU. FT/SEC |
|---------|----------------------------------|--------------------------|----------------------------|--------------------------|-----------------------------|
| 1       | 431.5                            | 0553                     | 603.6                      | 2348                     | 281.2                       |
| 2       | 189.7                            | 0028                     | 291.2                      | 2358                     | 138.7                       |
| 3       | 100.6                            | 0003                     | 138.7                      | 2358                     | 80.4                        |
| 4       | 60.0                             | 0003                     | 80.4                       | 2353                     | 47.8                        |
| 5       | 49.2                             | 2358                     | 98.2                       | 1218                     | 41.1                        |
| 6       | 629.0                            | 1853                     | 1328.4                     | 0003                     | 98.2                        |
| 7       | 479.8                            | 0003                     | 1051.9                     | 2353                     | 266.6                       |
| 8       | 168.0                            | 0008                     | 271.4                      | 2358                     | 115.8                       |
| 9       | 84.6                             | 0003                     | 115.8                      | 2358                     | 50.6                        |
| 10      | 56.7                             | 1658                     | 86.8                       | 0508                     | 42.4                        |
| 11      | 98.2                             | 1538                     | 837.7                      | 0418                     | 23.0                        |
| 12      | 35.2                             | 0013                     | 39.9                       | 1303                     | 30.0                        |
| 13      | 121.3                            | 1643                     | 880.1                      | 0858                     | 20.8                        |
| 14      | 74.4                             | 0318                     | 637.6                      | 0333                     | 33.1                        |
| 15      | 129.8                            | 2353                     | 266.6                      | 0008                     | 60.0                        |
| 16      | 217.5                            | 0018                     | 271.4                      | 0928                     | 178.6                       |
| 17      | 124.1                            | 0013                     | 193.5                      | 1028                     | 84.6                        |
| 18      | 451.8                            | 1803                     | 1064.1                     | 1253                     | 32.0                        |
| 19      | 509.0                            | 0008                     | 682.0                      | 0818                     | 16.3                        |
| 20      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 21      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 22      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 23      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 24      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 25      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 26      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 27      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 28      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 29      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| 30      | - - -                            | - - -                    | - - -                      | - - -                    | - - -                       |
| TOTAL   | 4010.3                           | - - -                    | - - -                      | - - -                    | - - -                       |
| AVERAGE | 211.1                            |                          | 470.5                      |                          | 86.4                        |
| MAXIMUM | 629.0                            |                          | 1328.4                     |                          | 281.2                       |
| MINIMUM | 35.2                             |                          | 39.9                       |                          | 16.3                        |
| ACRE FT | 7940.4                           |                          | - - -                      |                          | - - -                       |

Upper West Fork Tamayariak River  
1990



## **Appendix B**

### **Surface Water Temperature Records**

## ARCTIC NATIONAL WILDLIFE REFUGE

## Akutoktak River

LOCATION.--Lat 60°49'58", long 143°46'50", in center sec. 36, T.6N., R.33E., 0.6 miles upstream from the confluence with the Okpilak River, 20.8 miles south-southwest of Kaktovik, Alaska.

DRAINAGE AREA.--97.1 mi<sup>2</sup>, of which 66.0 mi<sup>2</sup> is located within the Arctic National Wildlife Refuge Wilderness Area.

PERIOD OF RECORD.--July to Sept. 1988; June to Sept. 1989; June to Sept. 1990.

REMARKS.--This is a 4th Order drainage. Discharge records are initiated during break-up and discontinued at freeze-up of each year.

EXTREME FOR PERIOD OF RECORD.--Maximum Temperature, 20.4°C July 4, 1990.

## JUNE 1990

| DATE    | Avg Temp<br>deg C | Time of<br>Max Temp | Max Temp<br>deg C | Time of<br>Min Temp | Min Temp<br>deg C |
|---------|-------------------|---------------------|-------------------|---------------------|-------------------|
| 1       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 2       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 3       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 4       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 5       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 6       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 7       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 8       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 9       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 10      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 11      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 12      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 13      | 9.0               | 1743                | 12.2              | 0718                | 6.5               |
| 14      | 10.3              | 1728                | 13.3              | 0623                | 7.5               |
| 15      | 11.0              | 1638                | 14.0              | 0643                | 8.5               |
| 16      | 10.7              | 1843                | 12.6              | 0718                | 8.8               |
| 17      | 11.4              | 1838                | 14.6              | 0808                | 9.2               |
| 18      | 12.2              | 1903                | 13.7              | 0523                | 10.3              |
| 19      | 12.9              | 1453                | 15.4              | 0533                | 10.4              |
| 20      | 12.8              | 1618                | 14.6              | 0623                | 10.6              |
| 21      | 11.9              | 1358                | 13.1              | 0633                | 10.8              |
| 22      | 13.1              | 1823                | 16.4              | 0558                | 10.0              |
| 23      | 11.9              | 0003                | 14.1              | 2358                | 9.8               |
| 24      | 11.7              | 1603                | 14.7              | 0618                | 8.9               |
| 25      | 13.5              | 1728                | 16.7              | 0613                | 10.8              |
| 26      | 11.8              | 1748                | 14.4              | 0713                | 9.7               |
| 27      | 12.9              | 1823                | 17.5              | 0633                | 9.1               |
| 28      | 14.9              | 1723                | 18.4              | 0613                | 11.8              |
| 29      | 15.4              | 1508                | 18.5              | 0523                | 12.1              |
| 30      | 16.6              | 1733                | 19.7              | 0633                | 13.6              |
| AVERAGE | 12.6              |                     | 15.4              |                     | 10.1              |
| MAXIMUM | 16.6              |                     | 19.7              |                     | 13.6              |
| MINIMUM | 10.3              |                     | 12.6              |                     | 7.5               |

## ARCTIC NATIONAL WILDLIFE REFUGE

Akutoktak River

JULY 1990

| DATE    | Avg Temp<br>deg C | Time of<br>Max Temp | Max Temp<br>deg C | Time of<br>Min Temp | Min Temp<br>deg C |
|---------|-------------------|---------------------|-------------------|---------------------|-------------------|
| 1       | 17.3              | 1633                | 20.4              | 0548                | 14.2              |
| 2       | 17.1              | 1718                | 19.5              | 0613                | 14.7              |
| 3       | 16.9              | 1713                | 19.9              | 0558                | 14.0              |
| 4       | 17.1              | 1728                | 20.4              | 0558                | 14.2              |
| 5       | 17.3              | 1713                | 20.1              | 0633                | 14.4              |
| 6       | 17.0              | 1718                | 19.9              | 0728                | 14.1              |
| 7       | 13.5              | 0003                | 17.1              | 2358                | 10.3              |
| 8       | 9.7               | 0003                | 10.3              | 2353                | 8.8               |
| 9       | 9.0               | 1453                | 10.3              | 0658                | 8.0               |
| 10      | 8.9               | 1823                | 10.2              | 0543                | 7.7               |
| 11      | 10.8              | 1743                | 14.2              | 0603                | 8.0               |
| 12      | 12.7              | 1813                | 16.4              | 0618                | 9.2               |
| 13      | 13.9              | 1658                | 17.1              | 0558                | 10.8              |
| 14      | 14.6              | 1603                | 17.8              | 0643                | 12.1              |
| 15      | 13.6              | 1943                | 15.2              | 0633                | 12.1              |
| 16      | 12.8              | 2038                | 14.4              | 0713                | 11.4              |
| 17      | 12.4              | 0003                | 13.4              | 0828                | 11.9              |
| 18      | 13.1              | 1823                | 16.0              | 0603                | 11.3              |
| 19      | 13.4              | 1923                | 15.3              | 0753                | 11.9              |
| 20      | 13.7              | 1533                | 15.0              | 0653                | 12.5              |
| 21      | 13.2              | 1753                | 14.2              | 2358                | 12.0              |
| 22      | 11.3              | 0003                | 12.0              | 1018                | 10.9              |
| 23      | 13.0              | 1708                | 16.6              | 0603                | 10.1              |
| 24      | 11.8              | 0003                | 13.1              | 2358                | 10.6              |
| 25      | 9.4               | 0003                | 10.6              | 2353                | 8.8               |
| 26      | 9.9               | 1818                | 12.4              | 0518                | 8.3               |
| 27      | 10.1              | 1853                | 12.6              | 0748                | 8.1               |
| 28      | 9.5               | 1843                | 10.3              | 0738                | 8.5               |
| 29      | 9.9               | 1803                | 11.6              | 0633                | 8.8               |
| 30      | 10.6              | 1828                | 12.9              | 0633                | 8.8               |
| 31      | 10.5              | 1738                | 12.8              | 0708                | 8.6               |
| AVERAGE | 12.7              |                     | 14.9              |                     | 10.8              |
| MAXIMUM | 17.3              |                     | 20.4              |                     | 14.7              |
| MINIMUM | 8.9               |                     | 10.2              |                     | 7.7               |

## ARCTIC NATIONAL WILDLIFE REFUGE

Akutoktak River

AUGUST 1990

| DATE    | AVG TEMP<br>DEG C | TIME OF<br>MAX TEMP | MAX TEMP<br>DEG C | TIME OF<br>MIN TEMP | MIN TEMP<br>DEG C |
|---------|-------------------|---------------------|-------------------|---------------------|-------------------|
| 1       | 11.0              | 1643                | 14.0              | 0633                | 8.2               |
| 2       | 11.5              | 1653                | 13.9              | 0728                | 9.6               |
| 3       | 9.1               | 0003                | 10.7              | 2358                | 8.3               |
| 4       | 8.5               | 1553                | 9.9               | 0723                | 7.4               |
| 5       | 9.4               | 1658                | 12.7              | 0713                | 6.6               |
| 6       | 9.3               | 1723                | 10.8              | 0743                | 8.1               |
| 7       | 9.0               | 1908                | 10.3              | 0648                | 7.9               |
| 8       | 8.7               | 1848                | 10.1              | 0638                | 7.5               |
| 9       | 8.5               | 1903                | 9.6               | 0718                | 7.3               |
| 10      | 8.5               | 1848                | 10.3              | 0803                | 7.3               |
| 11      | 9.5               | 1858                | 12.5              | 0803                | 7.2               |
| 12      | 10.0              | 1743                | 13.6              | 0728                | 6.8               |
| 13      | 10.5              | 1648                | 12.9              | 0823                | 8.6               |
| 14      | 9.8               | 1718                | 12.5              | 0843                | 8.0               |
| 15      | 8.6               | 1703                | 10.4              | 0903                | 7.5               |
| 16      | 8.3               | 1723                | 10.7              | 0423                | 6.7               |
| 17      | 8.6               | 1718                | 11.8              | 0753                | 6.5               |
| 18      | 7.6               | 1643                | 8.5               | 0823                | 6.8               |
| 19      | 7.9               | 1703                | 10.1              | 0723                | 6.2               |
| 20      | 6.7               | 1708                | 7.6               | 0803                | 5.8               |
| 21      | 6.6               | 1733                | 8.8               | 0713                | 5.0               |
| 22      | 6.1               | 1803                | 9.0               | 0713                | 3.4               |
| 23      | 5.8               | 1728                | 8.3               | 0753                | 3.4               |
| 24      | 6.3               | 1758                | 8.7               | 0708                | 4.2               |
| 25      | 6.8               | 1608                | 8.5               | 2358                | 5.5               |
| 26      | 7.1               | 1623                | 10.1              | 0633                | 4.5               |
| 27      | 8.0               | 1713                | 9.0               | 0933                | 7.2               |
| 28      | 6.6               | 0003                | 7.5               | 2358                | 5.9               |
| 29      | 5.5               | 1728                | 6.0               | 0843                | 4.8               |
| 30      | 5.6               | 1758                | 6.5               | 0708                | 4.6               |
| 31      | 6.2               | 1628                | 7.3               | 0733                | 5.3               |
| AVERAGE | 8.1               |                     | 10.1              |                     | 6.5               |
| MAXIMUM | 11.5              |                     | 14.0              |                     | 9.6               |
| MINIMUM | 5.5               |                     | 6.0               |                     | 3.4               |

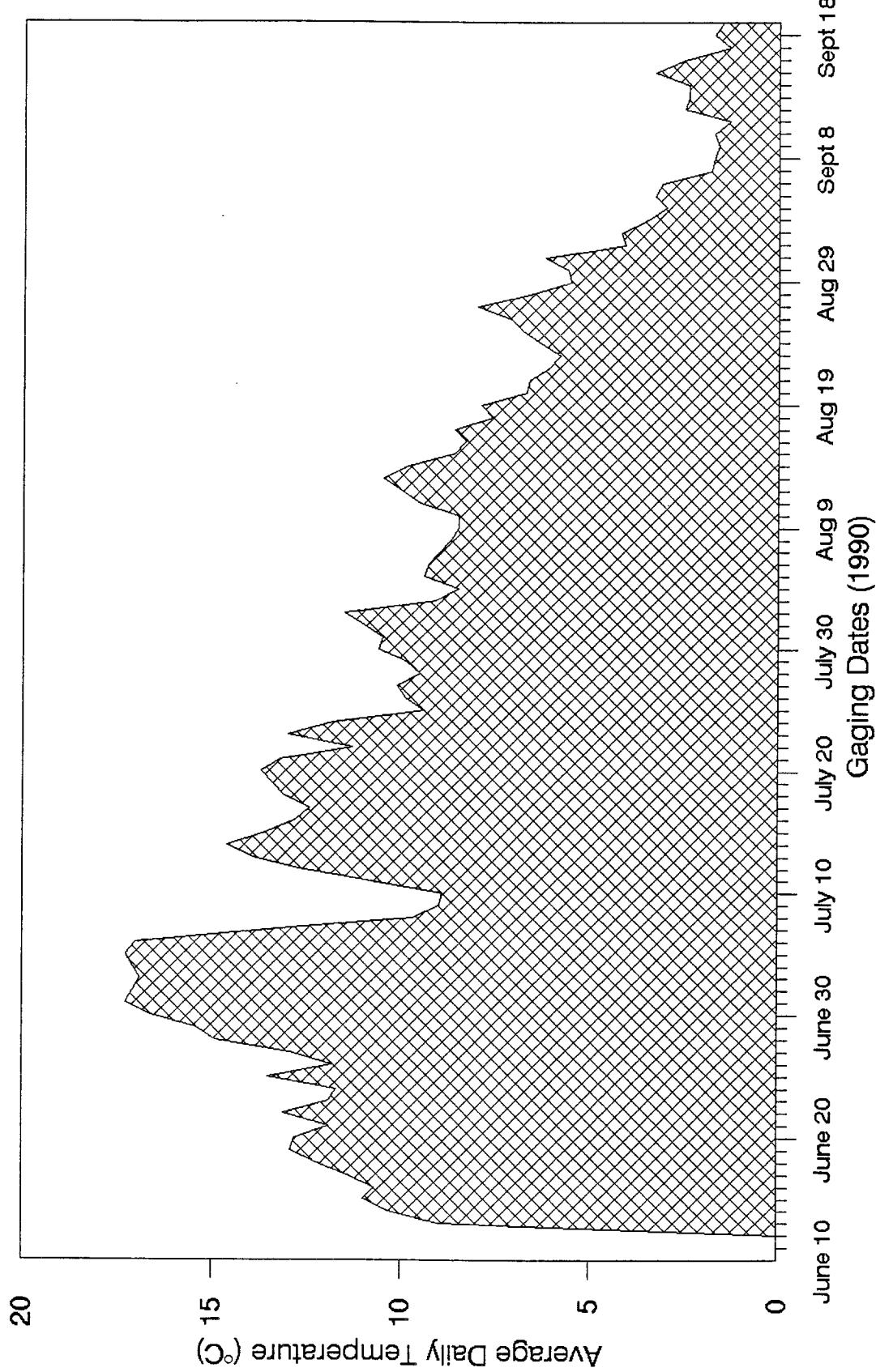
## ARCTIC NATIONAL WILDLIFE REFUGE

Akutoktak River

SEPTEMBER 1990

| DATE    | Avg Temp<br>deg C | Time of<br>Max Temp | Max Temp<br>deg C | Time of<br>Min Temp | Min Temp<br>deg C |
|---------|-------------------|---------------------|-------------------|---------------------|-------------------|
| 1       | 4.1               | 0003                | 6.0               | 1208                | 3.2               |
| 2       | 4.2               | 1658                | 6.1               | 0703                | 3.0               |
| 3       | 3.5               | 1748                | 5.7               | 0758                | 1.7               |
| 4       | 3.0               | 1733                | 3.9               | 0833                | 2.0               |
| 5       | 3.3               | 1658                | 4.6               | 0743                | 2.2               |
| 6       | 3.1               | 1608                | 3.8               | 2358                | 2.5               |
| 7       | 1.8               | 1738                | 2.7               | 0743                | 0.6               |
| 8       | 1.7               | 1533                | 2.6               | 2358                | 1.0               |
| 9       | 1.6               | 1718                | 3.6               | 0748                | 0.2               |
| 10      | 1.7               | 1733                | 4.1               | 0423                | 0.1               |
| 11      | 1.3               | 1813                | 2.6               | 0643                | 0.1               |
| 12      | 2.5               | 1718                | 4.7               | 0748                | 0.7               |
| 13      | 2.4               | 1813                | 4.1               | 0823                | 0.8               |
| 14      | 2.4               | 1838                | 3.3               | 0838                | 1.4               |
| 15      | 3.3               | 1613                | 4.2               | 0808                | 2.7               |
| 16      | 2.5               | 1703                | 4.4               | 0848                | 0.9               |
| 17      | 1.3               | 0003                | 2.1               | 2358                | 0.8               |
| 18      | 1.7               | 1703                | 3.3               | 0133                | 0.8               |
| 19      | 1.5               | 0003                | 2.1               | 0808                | 1.2               |
| 20      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 21      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 22      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 23      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 24      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 25      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 26      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 27      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 28      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 29      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 30      | - - -             | - - -               | - - -             | - - -               | - - -             |
| AVERAGE | 2.5               |                     | 27.3              |                     | 17.5              |
| MAXIMUM | 4.2               |                     | 70.5              |                     | 44.0              |
| MINIMUM | 1.3               |                     | 9.4               |                     | 6.9               |

Akutoktak River  
1990



## ARCTIC NATIONAL WILDLIFE REFUGE

## Itkilyariak Creek, West Fork

LOCATION.--Lat 69°50'19", long 144°24'43", NE 1/4 NW 1/4 NW 1/4 sec. 33, T.6N., R.31E., 0.6 miles upstream from the confluence with the Itkilyariak Creek, 20.75 miles south-southwest of Kaktovik, Alaska.

DRAINAGE AREA.--26.9 mi<sup>2</sup>, of which 8.7 mi<sup>2</sup> is located within the Arctic National Wildlife Refuge Wilderness Area.

PERIOD OF RECORD.--June to Sept. 1989; June to Sept. 1990.

REMARKS.--This is a 3rd Order drainage. Discharge records are initiated during break-up and discontinued at freeze-up of each year.

EXTREME FOR PERIOD OF RECORD.--Maximum Temperature, 17.7°C Aug. 8, 1989.

## JUNE 1990

| DATE    | Avg Temp<br>deg C | Time of<br>Max Temp | Max Temp<br>deg C | Time of<br>Min Temp | Min Temp<br>deg C |
|---------|-------------------|---------------------|-------------------|---------------------|-------------------|
| 1       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 2       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 3       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 4       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 5       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 6       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 7       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 8       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 9       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 10      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 11      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 12      | 6.9               | 1814                | 10.7              | 0534                | 3.3               |
| 13      | 7.5               | 1619                | 9.7               | 0709                | 5.3               |
| 14      | 8.8               | 1719                | 11.9              | 0529                | 5.8               |
| 15      | 10.2              | 1534                | 13.5              | 0554                | 7.7               |
| 16      | 10.2              | 1304                | 11.9              | 0629                | 8.6               |
| 17      | 10.9              | 1759                | 13.8              | 0849                | 8.5               |
| 18      | 11.5              | 1429                | 13.9              | 0559                | 9.5               |
| 19      | 11.1              | 1149                | 12.9              | 0544                | 10.0              |
| 20      | 10.9              | 1904                | 13.4              | 0514                | 8.1               |
| 21      | 11.0              | 0004                | 12.0              | 0534                | 10.2              |
| 22      | 12.2              | 1744                | 15.6              | 0509                | 9.1               |
| 23      | 10.9              | 0004                | 12.6              | 2359                | 9.1               |
| 24      | 10.7              | 1414                | 13.1              | 0609                | 8.2               |
| 25      | 12.3              | 1654                | 15.0              | 0459                | 9.7               |
| 26      | 10.9              | 1744                | 13.0              | 0644                | 9.3               |
| 27      | 11.5              | 1759                | 14.5              | 0649                | 8.7               |
| 28      | 13.0              | 1819                | 15.3              | 0544                | 10.9              |
| 29      | 13.0              | 1439                | 15.0              | 0614                | 11.2              |
| 30      | 13.5              | 1729                | 15.8              | 0614                | 11.3              |
| AVERAGE | 10.9              |                     | 13.3              |                     | 8.7               |
| MINIMUM | 13.5              |                     | 15.8              |                     | 11.3              |
| MINIMUM | 6.9               |                     | 9.7               |                     | 3.3               |

ARCTIC NATIONAL WILDLIFE REFUGE  
Itkilyariak Creek, West Fork

JULY 1990

| DATE    | Avg Temp<br>deg C | Time of<br>Max Temp | Max Temp<br>deg C | Time of<br>Min Temp | Min Temp<br>deg C |
|---------|-------------------|---------------------|-------------------|---------------------|-------------------|
| 1       | 14.3              | 1724                | 16.6              | 0604                | 12.3              |
| 2       | 14.6              | 1709                | 16.9              | 0559                | 12.4              |
| 3       | 15.0              | 1839                | 17.4              | 0534                | 12.5              |
| 4       | 15.2              | 1719                | 17.6              | 0554                | 12.9              |
| 5       | 15.2              | 1729                | 17.4              | 0604                | 12.8              |
| 6       | 15.0              | 1749                | 17.3              | 0629                | 12.7              |
| 7       | 11.9              | 0004                | 15.2              | 2359                | 9.1               |
| 8       | 8.2               | 0004                | 9.1               | 2359                | 7.3               |
| 9       | 7.8               | 1704                | 8.9               | 0509                | 6.9               |
| 10      | 8.2               | 1909                | 9.4               | 0529                | 7.1               |
| 11      | 9.6               | 1829                | 12.2              | 0604                | 7.6               |
| 12      | 11.1              | 1849                | 13.8              | 0654                | 8.5               |
| 13      | 11.8              | 1804                | 13.6              | 0614                | 9.6               |
| 14      | 11.4              | 1634                | 12.8              | 0709                | 9.8               |
| 15      | 11.4              | 2019                | 12.6              | 0624                | 10.4              |
| 16      | 11.2              | 1804                | 12.8              | 0614                | 9.5               |
| 17      | 10.7              | 2134                | 11.4              | 0749                | 10.1              |
| 18      | 12.0              | 1614                | 14.4              | 0539                | 9.7               |
| 19      | 12.0              | 1909                | 13.9              | 0634                | 10.2              |
| 20      | 12.2              | 1624                | 13.7              | 0604                | 10.7              |
| 21      | 12.0              | 1614                | 13.4              | 2359                | 11.0              |
| 22      | 10.5              | 0004                | 10.9              | 1034                | 9.8               |
| 23      | 11.6              | 1539                | 14.0              | 0544                | 9.3               |
| 24      | 10.4              | 1704                | 11.7              | 2359                | 9.4               |
| 25      | 8.8               | 0004                | 9.4               | 2359                | 8.2               |
| 26      | 8.7               | 1714                | 10.5              | 0554                | 7.5               |
| 27      | 8.3               | 1754                | 10.7              | 0539                | 6.4               |
| 28      | 7.9               | 1649                | 8.8               | 0639                | 7.0               |
| 29      | 8.7               | 1719                | 10.4              | 0619                | 7.6               |
| 30      | 9.5               | 1704                | 11.7              | 0609                | 7.8               |
| 31      | 9.2               | 1604                | 11.0              | 0624                | 7.6               |
| AVERAGE | 11.1              |                     | 12.9              |                     | 9.5               |
| MAXIMUM | 15.2              |                     | 17.6              |                     | 12.9              |
| MINIMUM | 7.8               |                     | 8.8               |                     | 6.4               |

ARCTIC NATIONAL WILDLIFE REFUGE  
Itkilyariak Creek, West Fork

AUGUST 1990

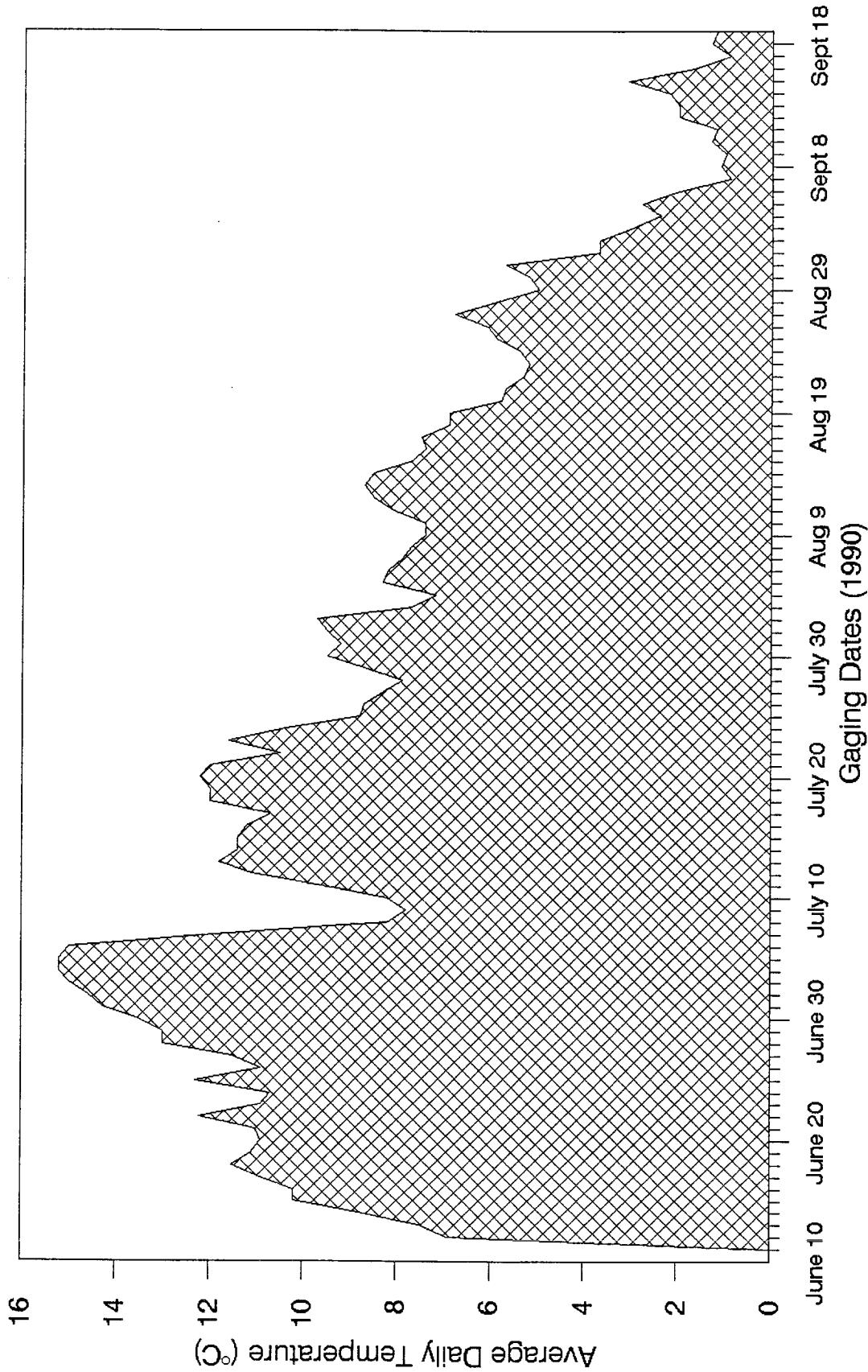
| DATE    | AVG TEMP<br>DEG C | TIME OF<br>MAX TEMP | MAX TEMP<br>DEG C | TIME OF<br>MIN TEMP | MIN TEMP<br>DEG C |
|---------|-------------------|---------------------|-------------------|---------------------|-------------------|
| 1       | 9.5               | 1649                | 12.0              | 0559                | 7.3               |
| 2       | 9.7               | 1649                | 11.8              | 0644                | 8.3               |
| 3       | 7.7               | 0004                | 8.6               | 2354                | 7.0               |
| 4       | 7.2               | 1649                | 8.2               | 0719                | 6.3               |
| 5       | 8.3               | 1719                | 11.1              | 0634                | 5.9               |
| 6       | 8.2               | 1644                | 9.1               | 0724                | 7.4               |
| 7       | 7.9               | 1844                | 8.8               | 0634                | 7.1               |
| 8       | 7.7               | 1804                | 8.7               | 0619                | 6.7               |
| 9       | 7.4               | 1909                | 8.4               | 0654                | 6.5               |
| 10      | 7.4               | 1829                | 8.6               | 0629                | 6.5               |
| 11      | 8.1               | 1719                | 10.5              | 0719                | 6.4               |
| 13      | 8.7               | 1734                | 11.1              | 0749                | 6.9               |
| 14      | 8.5               | 1744                | 10.7              | 0759                | 7.1               |
| 18      | 6.9               | 1704                | 7.7               | 0709                | 6.2               |
| 19      | 6.9               | 1654                | 9.0               | 0739                | 5.7               |
| 20      | 5.8               | 1744                | 6.8               | 0744                | 5.2               |
| 21      | 5.7               | 1744                | 7.7               | 0709                | 4.4               |
| 22      | 5.3               | 1709                | 7.9               | 0734                | 3.1               |
| 23      | 5.2               | 1709                | 7.6               | 0729                | 3.2               |
| 24      | 5.4               | 1659                | 7.5               | 0729                | 3.5               |
| 25      | 5.9               | 1654                | 7.8               | 0814                | 4.7               |
| 27      | 6.8               | 1509                | 7.5               | 2339                | 5.9               |
| 28      | 5.9               | 1634                | 6.9               | 0719                | 5.2               |
| 29      | 5.0               | 1649                | 5.5               | 0754                | 4.5               |
| 30      | 5.2               | 1704                | 6.1               | 0554                | 4.3               |
| 31      | 5.7               | 1554                | 6.7               | 0654                | 4.8               |
| AVERAGE | 7.1               |                     | 8.8               |                     | 5.8               |
| MAXIMUM | 9.7               |                     | 12.0              |                     | 8.3               |
| MINIMUM | 5.0               |                     | 5.5               |                     | 3.1               |

ARCTIC NATIONAL WILDLIFE REFUGE  
Itkilyariak Creek, West Fork

SEPTEMBER 1990

| DATE    | Avg Temp<br>deg C | Time of<br>Max Temp | Max Temp<br>deg C | Time of<br>Min Temp | Min Temp<br>deg C |
|---------|-------------------|---------------------|-------------------|---------------------|-------------------|
| 1       | 3.7               | 0004                | 5.4               | 1109                | 2.7               |
| 2       | 3.7               | 1604                | 5.4               | 0639                | 2.7               |
| 3       | 3.0               | 1644                | 5.3               | 0734                | 1.2               |
| 4       | 2.4               | 1434                | 3.5               | 0739                | 1.2               |
| 5       | 2.8               | 1704                | 4.1               | 0729                | 1.8               |
| 6       | 2.0               | 1514                | 2.6               | 2359                | 0.8               |
| 7       | 0.9               | 1714                | 2.3               | 0709                | -0.1              |
| 8       | 1.1               | 1514                | 2.1               | 0644                | 0.4               |
| 9       | 1.0               | 1644                | 3.0               | 0709                | -0.1              |
| 10      | 1.3               | 1624                | 3.5               | 0114                | -0.1              |
| 11      | 1.2               | 1649                | 2.7               | 0504                | 0.0               |
| 12      | 2.0               | 1634                | 4.0               | 0554                | 0.5               |
| 13      | 2.0               | 1649                | 3.8               | 0744                | 0.5               |
| 14      | 2.2               | 1724                | 3.1               | 0759                | 1.2               |
| 15      | 3.1               | 1409                | 4.3               | 2359                | 2.1               |
| 16      | 1.7               | 1649                | 3.6               | 0749                | 0.0               |
| 17      | 0.9               | 1514                | 1.5               | 0824                | 0.4               |
| 18      | 1.3               | 1639                | 2.7               | 0034                | 0.4               |
| 19      | 1.2               | 1544                | 1.6               | 0724                | 0.8               |
| 20      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 21      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 22      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 23      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 30      | - - -             | - - -               | - - -             | - - -               | - - -             |
| AVERAGE | 2.0               |                     | 3.4               |                     | 0.9               |
| MAXIMUM | 3.7               |                     | 5.4               |                     | 2.7               |
| MINIMUM | 0.9               |                     | 1.5               |                     | -0.1              |

West Fork Itkillyariak Creek  
1990



## ARCTIC NATIONAL WILDLIFE REFUGE

## Sadlerochit River

LOCATION.--Lat 69°38', long 144° 22'50", in NW&SW& sec. 31, T.4N., R.32E., 0.5 miles below the Wilderness boundary, 37.5 miles southwest of Kaktovik, Alaska.

DRAINAGE AREA.--520.1 mi<sup>2</sup>, of which 517.5 mi<sup>2</sup> is located within the Arctic National Wildlife Refuge Wilderness Area. Glaciers account for 2.3 percent of the drainage area or about 11.8 mi<sup>2</sup> depending on existing climatic conditions.

PERIOD OF RECORD.-- July to Sept. 1988; June to Sept. 1989; June to Sept. 1990.

REMARKS.--This is a 6th Order drainage. Discharge records are initiated during break-up and discontinued at freeze-up of each year.

EXTREME FOR PERIOD OF RECORD.--Maximum Temperature, 15.9°C August 13, 1989 and July 6, 1990.

## JUNE 1990

| DATE    | Avg Temp<br>deg C | Time of<br>Max Temp | Max Temp<br>deg C | Time of<br>Min Temp | Min Temp<br>deg C |
|---------|-------------------|---------------------|-------------------|---------------------|-------------------|
| 1       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 2       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 3       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 4       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 5       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 6       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 7       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 8       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 9       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 10      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 11      | 6.1               | 1807                | 9.2               | 0717                | 2.7               |
| 12      | 8.9               | 1832                | 13.1              | 0557                | 4.9               |
| 13      | 10.4              | 1747                | 11.7              | 0847                | 9.4               |
| 14      | 10.6              | 1852                | 13.4              | 0742                | 8.0               |
| 15      | 10.6              | 1537                | 12.4              | 0752                | 8.8               |
| 16      | 8.4               | 1827                | 10.2              | 0642                | 6.7               |
| 17      | 8.9               | 1912                | 11.5              | 0832                | 6.4               |
| 18      | 8.7               | 0002                | 10.7              | 0657                | 6.4               |
| 19      | 8.7               | 1347                | 10.3              | 0707                | 7.3               |
| 20      | 8.5               | 2057                | 11.3              | 0632                | 6.0               |
| 21      | 9.1               | 0002                | 10.6              | 2357                | 8.2               |
| 22      | 10.1              | 1932                | 13.7              | 0627                | 7.1               |
| 23      | 9.8               | 0002                | 12.2              | 2357                | 7.8               |
| 24      | 9.1               | 2027                | 11.9              | 0602                | 6.3               |
| 25      | 11.4              | 1857                | 14.6              | 0637                | 8.3               |
| 26      | 12.1              | 1657                | 14.0              | 0742                | 9.9               |
| 27      | 12.6              | 1812                | 14.8              | 0657                | 10.0              |
| 28      | 12.3              | 1657                | 14.1              | 0657                | 10.1              |
| 29      | 10.8              | 1907                | 12.5              | 0752                | 9.0               |
| 30      | 11.0              | 1907                | 14.1              | 0642                | 8.0               |
| AVERAGE | 9.9               |                     | 12.3              |                     | 7.6               |
| MAXIMUM | 12.6              |                     | 14.8              |                     | 10.1              |
| MINIMUM | 6.1               |                     | 9.2               |                     | 2.7               |

## ARCTIC NATIONAL WILDLIFE REFUGE

Sadlerochit River

JULY 1990

| DATE    | Avg Temp<br>deg C | Time of<br>Max Temp | Max Temp<br>deg C | Time of<br>Min Temp | Min Temp<br>deg C |
|---------|-------------------|---------------------|-------------------|---------------------|-------------------|
| 1       | 12.3              | 1827                | 15.1              | 0642                | 9.5               |
| 2       | 12.7              | 1917                | 15.1              | 0727                | 10.0              |
| 3       | 12.8              | 1752                | 15.7              | 0707                | 10.2              |
| 4       | 12.5              | 1802                | 15.2              | 0722                | 9.7               |
| 5       | 12.6              | 1747                | 15.6              | 0637                | 9.5               |
| 6       | 13.0              | 1722                | 15.9              | 0732                | 10.5              |
| 7       | 10.8              | 0002                | 12.7              | 2357                | 8.5               |
| 8       | 6.0               | 0002                | 8.4               | 2357                | 5.3               |
| 9       | 5.9               | 2137                | 7.1               | 0637                | 5.0               |
| 10      | 7.8               | 2012                | 9.8               | 0647                | 6.2               |
| 11      | 9.5               | 1947                | 13.0              | 0732                | 6.6               |
| 12      | 11.6              | 1837                | 14.6              | 0722                | 8.7               |
| 13      | 11.0              | 1757                | 12.6              | 0622                | 8.7               |
| 14      | 11.0              | 1647                | 12.6              | 0752                | 9.3               |
| 15      | 10.4              | 1847                | 12.1              | 0802                | 9.1               |
| 16      | 9.9               | 2047                | 11.1              | 0712                | 8.3               |
| 17      | 9.4               | 0002                | 10.8              | 0917                | 8.7               |
| 18      | 11.5              | 1922                | 14.3              | 0712                | 9.0               |
| 19      | 11.8              | 1827                | 13.8              | 0842                | 9.5               |
| 20      | 11.9              | 1747                | 13.5              | 0722                | 10.4              |
| 21      | 11.6              | 1837                | 13.8              | 0702                | 10.2              |
| 22      | 10.8              | 1802                | 12.3              | 1002                | 9.6               |
| 23      | 11.5              | 1822                | 13.9              | 0632                | 9.6               |
| 24      | 10.4              | 0002                | 11.9              | 0842                | 9.1               |
| 25      | 7.7               | 0002                | 9.9               | 1137                | 7.1               |
| 26      | 7.9               | 1847                | 10.7              | 0632                | 6.4               |
| 27      | 8.8               | 1822                | 11.4              | 0747                | 6.4               |
| 28      | 8.0               | 0002                | 9.7               | 0647                | 7.1               |
| 29      | 9.2               | 2012                | 11.2              | 0742                | 7.5               |
| 30      | 10.1              | 2012                | 11.8              | 0737                | 8.7               |
| 31      | 10.3              | 1752                | 11.8              | 0857                | 8.9               |
| AVERAGE | 10.3              |                     | 12.5              |                     | 8.5               |
| MAXIMUM | 13.0              |                     | 15.9              |                     | 10.5              |
| MINIMUM | 5.9               |                     | 7.1               |                     | 5.0               |

## ARCTIC NATIONAL WILDLIFE REFUGE

Sadlerochit River

AUGUST 1990

| DATE    | AVG TEMP<br>DEG C | TIME OF<br>MAX TEMP | MAX TEMP<br>DEG C | TIME OF<br>MIN TEMP | MIN TEMP<br>DEG C |
|---------|-------------------|---------------------|-------------------|---------------------|-------------------|
| 1       | 10.1              | 1832                | 12.9              | 0737                | 7.4               |
| 2       | 10.5              | 1912                | 12.5              | 0657                | 8.7               |
| 3       | 7.7               | 0002                | 10.5              | 2357                | 6.9               |
| 4       | 6.8               | 1912                | 7.8               | 0822                | 6.0               |
| 5       | 8.8               | 1902                | 12.0              | 0712                | 5.8               |
| 6       | 9.3               | 0002                | 10.7              | 0742                | 8.0               |
| 7       | 9.3               | 2117                | 10.1              | 0752                | 8.4               |
| 8       | 10.3              | 1747                | 12.4              | 0932                | 8.4               |
| 9       | 9.8               | 0002                | 11.4              | 1017                | 8.6               |
| 10      | 10.1              | 1727                | 11.9              | 0827                | 8.7               |
| 11      | 10.9              | 1902                | 13.2              | 0832                | 9.1               |
| 12      | 11.4              | 1832                | 14.1              | 0752                | 8.7               |
| 13      | 11.8              | 1807                | 14.0              | 0737                | 9.6               |
| 14      | 11.8              | 1837                | 14.1              | 0757                | 9.8               |
| 15      | 11.4              | 1802                | 12.7              | 1107                | 10.2              |
| 16      | 10.2              | 2047                | 11.3              | 0952                | 9.1               |
| 17      | 10.6              | 1802                | 12.9              | 0732                | 8.4               |
| 18      | 9.5               | 0002                | 11.1              | 0827                | 8.4               |
| 19      | 8.3               | 0002                | 9.8               | 2357                | 7.1               |
| 20      | 5.9               | 0002                | 7.1               | 0752                | 4.9               |
| 21      | 6.3               | 1812                | 8.8               | 0752                | 4.2               |
| 22      | 7.2               | 1852                | 9.9               | 0752                | 4.4               |
| 23      | 8.0               | 1757                | 10.3              | 0842                | 5.7               |
| 24      | 7.9               | 1747                | 10.2              | 0802                | 5.6               |
| 25      | 8.3               | 1707                | 9.9               | 0752                | 6.8               |
| 26      | 9.1               | 1717                | 11.3              | 0352                | 6.9               |
| 27      | 8.9               | 0002                | 10.4              | 0857                | 8.1               |
| 28      | 6.7               | 0002                | 8.2               | 2357                | 5.9               |
| 29      | 4.9               | 0002                | 5.9               | 1017                | 4.5               |
| 30      | 5.3               | 1832                | 6.7               | 0722                | 4.1               |
| 31      | 6.3               | 1637                | 7.0               | 0902                | 5.6               |
| AVERAGE | 8.8               |                     | 10.7              |                     | 7.2               |
| MAXIMUM | 11.8              |                     | 14.1              |                     | 10.2              |
| MINIMUM | 4.9               |                     | 5.9               |                     | 4.1               |

## ARCTIC NATIONAL WILDLIFE REFUGE

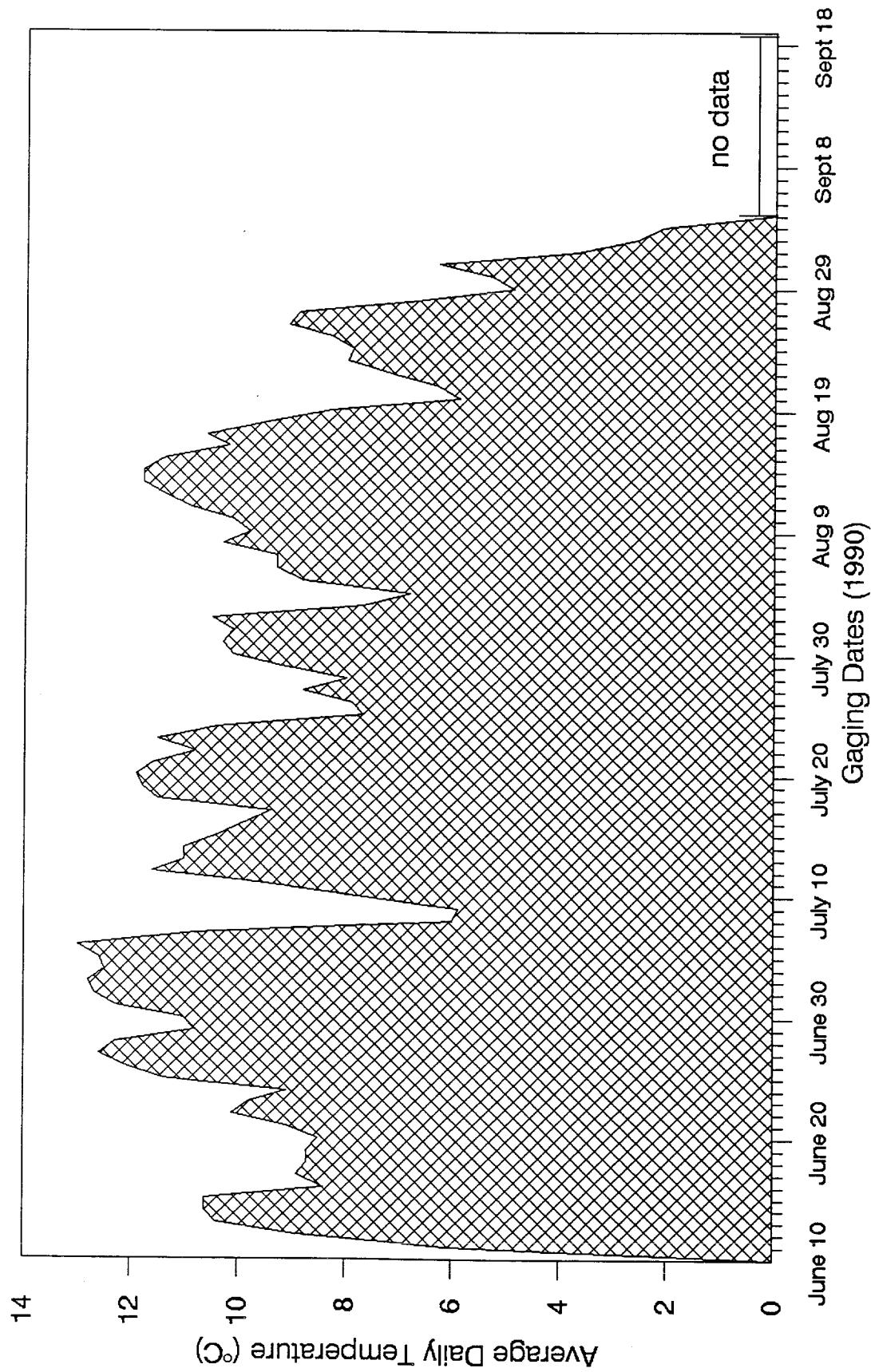
Sadlerochit River

SEPTEMBER 1990

| DATE    | AVG TEMP<br>DEG C | TIME OF<br>MAX TEMP | MAX TEMP<br>DEG C | TIME OF<br>MIN TEMP | MIN TEMP<br>DEG C |
|---------|-------------------|---------------------|-------------------|---------------------|-------------------|
| 1       | 3.7               | 0002                | 5.9               | 2357                | 2.7               |
| 2       | 2.6               | 1617                | 3.5               | 0827                | 1.8               |
| 3       | 2.1               | 1807                | 4.1               | 0712                | 0.1               |
| 4       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 5       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 6       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 7       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 8       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 9       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 10      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 11      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 12      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 13      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 14      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 15      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 16      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 17      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 18      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 19      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 20      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 21      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 22      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 23      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 24      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 25      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 26      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 27      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 28      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 29      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 30      | - - -             | - - -               | - - -             | - - -               | - - -             |
| AVERAGE | - - -             | - - -               | - - -             | - - -               | - - -             |
| MAXIMUM | - - -             | - - -               | - - -             | - - -               | - - -             |
| MINIMUM | - - -             | - - -               | - - -             | - - -               | - - -             |

Sadlerochit River  
1990

B-15



## ARCTIC NATIONAL WILDLIFE REFUGE

## Sadlerochit Spring Creek

LOCATION.--Lat 69°39'53", long 144°24'52", NE 1/4 NW 1/4 sec. 36, T.4N., R.31E., 3000 ft. downstream of Sadlerochit Spring, 37.5 mi. southwest of Kaktovik, Alaska.

DRAINAGE AREA.--0.5 mi<sup>2</sup>.

PERIOD OF RECORD.--July to Dec. 1988; June to Sept. 1989; June to Sept. 1990.

REMARKS.--This is a 2nd Order drainage with 2 springs contributing most of the flow.

EXTREME FOR PERIOD OF RECORD.--Maximum Temperature, 16.6°C July 23, 1990.

## JUNE 1990

| DATE    | Avg Temp<br>deg C | Time of<br>Max Temp | Max Temp<br>deg C | Time of<br>Min Temp | Min Temp<br>deg C |
|---------|-------------------|---------------------|-------------------|---------------------|-------------------|
| 1       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 2       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 3       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 4       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 5       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 6       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 7       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 8       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 9       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 10      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 11      | 12.2              | 1452                | 14.1              | 0507                | 10.4              |
| 12      | 13.2              | 1532                | 14.9              | 0042                | 11.3              |
| 13      | 13.0              | 1337                | 14.7              | 0247                | 12.2              |
| 14      | 13.5              | 1507                | 15.1              | 0412                | 12.1              |
| 15      | 13.5              | 1407                | 15.4              | 0222                | 12.5              |
| 16      | 13.3              | 1822                | 14.5              | 0507                | 12.4              |
| 17      | 12.9              | 1747                | 14.0              | 0817                | 12.2              |
| 18      | 12.5              | 1002                | 13.7              | 1712                | 11.4              |
| 19      | 12.7              | 1202                | 14.8              | 0302                | 11.6              |
| 20      | 13.1              | 1327                | 15.0              | 0357                | 11.4              |
| 21      | 12.8              | 1037                | 13.8              | 2347                | 12.1              |
| 22      | 13.3              | 1517                | 15.1              | 0322                | 11.6              |
| 23      | 12.2              | 1042                | 13.7              | 1937                | 11.4              |
| 24      | 12.8              | 1437                | 14.6              | 0212                | 11.4              |
| 25      | 13.5              | 1427                | 15.1              | 0122                | 11.8              |
| 26      | 13.2              | 1517                | 14.8              | 0057                | 12.0              |
| 27      | 13.6              | 1322                | 15.3              | 0317                | 11.9              |
| 28      | 13.9              | 1342                | 15.4              | 0257                | 12.6              |
| 29      | 13.5              | 1307                | 15.7              | 0137                | 12.6              |
| 30      | 14.0              | 1332                | 15.6              | 0412                | 12.5              |
| AVERAGE | 13.1              |                     | 14.8              |                     | 11.9              |
| MAXIMUM | 14.0              |                     | 15.7              |                     | 12.6              |
| MINIMUM | 12.2              |                     | 13.7              |                     | 10.4              |

## ARCTIC NATIONAL WILDLIFE REFUGE

## Sadlerochit Spring Creek

JULY 1990

| DATE    | Avg Temp<br>deg C | Time of<br>Max Temp | Max Temp<br>deg C | Time of<br>Min Temp | Min Temp<br>deg C |
|---------|-------------------|---------------------|-------------------|---------------------|-------------------|
| 1       | 14.2              | 1457                | 15.9              | 0307                | 12.6              |
| 2       | 14.1              | 1422                | 15.6              | 0312                | 12.6              |
| 3       | 14.3              | 1432                | 15.8              | 0232                | 12.8              |
| 4       | 14.1              | 1437                | 15.6              | 0337                | 12.8              |
| 5       | 14.1              | 1452                | 15.8              | 0257                | 12.6              |
| 6       | 14.0              | 1512                | 15.8              | 0327                | 12.8              |
| 7       | 12.9              | 1202                | 14.7              | 2337                | 11.6              |
| 8       | 12.1              | 1432                | 12.4              | 0057                | 11.7              |
| 9       | 12.3              | 1402                | 12.8              | 0352                | 11.9              |
| 10      | 13.0              | 1417                | 13.6              | 0342                | 12.3              |
| 11      | 14.3              | 1452                | 15.8              | 0332                | 13.1              |
| 12      | 14.4              | 1437                | 16.0              | 0312                | 13.1              |
| 13      | 14.2              | 1247                | 16.0              | 0312                | 13.0              |
| 14      | 14.3              | 1207                | 16.0              | 0157                | 13.2              |
| 15      | 14.1              | 1542                | 15.2              | 0422                | 13.4              |
| 16      | 14.2              | 1522                | 15.3              | 0202                | 13.4              |
| 17      | 14.0              | 1937                | 14.6              | 0002                | 13.7              |
| 18      | 14.6              | 1342                | 15.9              | 0437                | 13.6              |
| 19      | 14.5              | 1402                | 16.0              | 0332                | 13.4              |
| 20      | 14.3              | 1442                | 16.1              | 0102                | 13.6              |
| 21      | 14.2              | 1717                | 15.5              | 2357                | 13.6              |
| 22      | 13.9              | 1722                | 14.3              | 0307                | 13.5              |
| 23      | 14.8              | 1327                | 16.6              | 0452                | 13.5              |
| 24      | 14.3              | 1302                | 14.9              | 2307                | 13.9              |
| 25      | 13.7              | 1442                | 14.0              | 0617                | 13.5              |
| 26      | 13.9              | 1147                | 14.4              | 2342                | 13.3              |
| 27      | 14.1              | 1317                | 15.5              | 0147                | 13.1              |
| 28      | 13.7              | 1527                | 14.1              | 0512                | 12.9              |
| 29      | 14.2              | 1232                | 14.8              | 0427                | 13.7              |
| 31      | 14.4              | 1542                | 15.5              | 2357                | 13.5              |
| AVERAGE | 14.0              |                     | 15.1              |                     | 13.1              |
| MAXIMUM | 14.8              |                     | 16.6              |                     | 13.9              |
| MINIMUM | 12.1              |                     | 12.4              |                     | 11.6              |

## ARCTIC NATIONAL WILDLIFE REFUGE

## Sadlerochit Spring Creek

AUGUST 1990

| DATE    | Avg Temp<br>deg C | Time of<br>Max Temp | Max Temp<br>deg C | Time of<br>Min Temp | Min Temp<br>deg C |
|---------|-------------------|---------------------|-------------------|---------------------|-------------------|
| 1       | 14.5              | 1427                | 15.9              | 0112                | 13.2              |
| 2       | 14.3              | 1327                | 15.7              | 0422                | 13.5              |
| 3       | 13.4              | 1252                | 13.8              | 0822                | 13.1              |
| 4       | 13.6              | 1447                | 14.0              | 2357                | 13.1              |
| 5       | 14.1              | 1502                | 15.6              | 0337                | 12.7              |
| 6       | 13.7              | 1512                | 14.3              | 0337                | 13.0              |
| 7       | 13.7              | 1457                | 14.2              | 0412                | 13.2              |
| 8       | 14.0              | 1607                | 15.0              | 0222                | 13.1              |
| 9       | 13.8              | 1352                | 14.3              | 2357                | 13.4              |
| 10      | 13.9              | 1637                | 14.9              | 0027                | 13.3              |
| 11      | 14.1              | 1437                | 15.4              | 2357                | 13.3              |
| 12      | 14.4              | 1417                | 16.0              | 0437                | 13.1              |
| 13      | 14.1              | 1512                | 15.5              | 2337                | 13.1              |
| 14      | 14.2              | 1527                | 15.4              | 0002                | 13.2              |
| 15      | 13.8              | 1642                | 14.9              | 2327                | 12.9              |
| 16      | 13.7              | 1622                | 14.3              | 0042                | 12.9              |
| 17      | 13.8              | 1517                | 15.1              | 2342                | 12.8              |
| 18      | 13.4              | 1252                | 14.1              | 0017                | 12.8              |
| 19      | 13.4              | 1547                | 14.3              | 2357                | 12.8              |
| 20      | 13.4              | 1702                | 14.1              | 0442                | 12.4              |
| 21      | 14.1              | 1542                | 15.4              | 0522                | 13.3              |
| 22      | 14.1              | 1457                | 15.5              | 0552                | 12.8              |
| 23      | 13.9              | 1352                | 15.2              | 2332                | 12.7              |
| 24      | 14.0              | 1442                | 15.3              | 0002                | 12.9              |
| 25      | 13.9              | 1452                | 15.0              | 2232                | 12.9              |
| 26      | 14.3              | 1447                | 15.6              | 0012                | 13.2              |
| 27      | 13.7              | 1507                | 14.7              | 0802                | 13.1              |
| 28      | 13.7              | 1322                | 14.2              | 2322                | 13.4              |
| 29      | 13.4              | 2137                | 13.7              | 0817                | 13.1              |
| 30      | 13.7              | 1227                | 14.5              | 0112                | 13.1              |
| 31      | 13.7              | 1127                | 14.5              | 1917                | 13.1              |
| AVERAGE | 13.9              |                     | 14.9              |                     | 13.0              |
| MAXIMUM | 14.5              |                     | 16.0              |                     | 13.5              |
| MINIMUM | 13.4              |                     | 13.7              |                     | 12.4              |

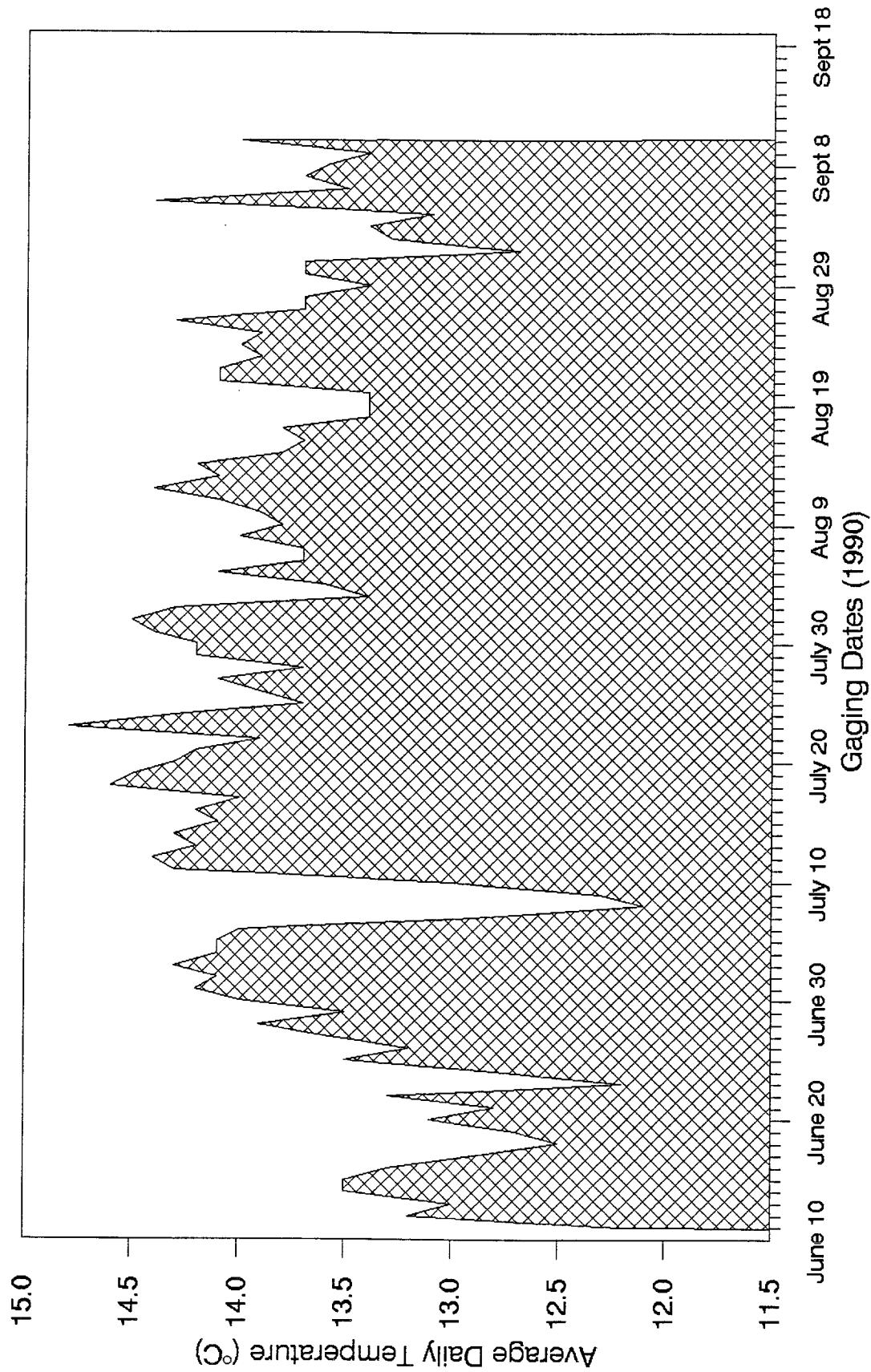
## ARCTIC NATIONAL WILDLIFE REFUGE

## Sadlerochit Spring Creek

SEPTEMBER 1990

| DATE    | AVG TEMP<br>DEG C | TIME OF<br>MAX TEMP | MAX TEMP<br>DEG C | TIME OF<br>MIN TEMP | MIN TEMP<br>DEG C |
|---------|-------------------|---------------------|-------------------|---------------------|-------------------|
| 1       | 12.7              | 0112                | 13.3              | 0557                | 11.9              |
| 2       | 13.3              | 1322                | 13.9              | 2357                | 12.8              |
| 3       | 13.4              | 1557                | 14.5              | 0707                | 12.7              |
| 4       | 13.1              | 1442                | 14.0              | 0642                | 11.9              |
| 5       | 14.4              | 1257                | 14.9              | 2217                | 13.5              |
| 6       | 13.5              | 0827                | 14.0              | 2002                | 12.9              |
| 7       | 13.7              | 1327                | 14.5              | 0542                | 12.6              |
| 8       | 13.6              | 1052                | 14.4              | 1907                | 12.3              |
| 9       | 13.4              | 1442                | 14.4              | 0342                | 12.6              |
| 10      | 14.0              | 2352                | 15.0              | 0252                | 13.0              |
| 11      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 12      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 13      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 14      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 15      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 16      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 17      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 18      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 19      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 20      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 21      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 22      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 23      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 24      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 25      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 26      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 27      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 28      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 29      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 30      | - - -             | - - -               | - - -             | - - -               | - - -             |
| AVERAGE | 13.5              |                     | 14.3              |                     | 12.6              |
| MAXIMUM | 14.4              |                     | 15.0              |                     | 13.5              |
| MINIMUM | 12.7              |                     | 13.3              |                     | 11.9              |

# Sadlerochit Springs Creek 1990



## ARCTIC NATIONAL WILDLIFE REFUGE

## Sikrelurak River

LOCATION.--Lat 69°54'43", Long 142°30'52", SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 36, T.7N., R.38E., at confluence with the West Fork Sikrelurak River, 31 mi south-east of Kaktovik, Alaska.

DRAINAGE AREA.-74.7 mi<sup>2</sup>.

PERIOD OF RECORD.--June to Sept. 1989; June to Sept. 1990.

REMARKS.--This is a 4th Order drainage. Discharge records are initiated during break-up and discontinued at freeze-up of each year.

EXTREME FOR PERIOD OF RECORD.--Maximum Temperature, 19.6°C July 1, 1990.

## JUNE 1990

| DATE    | Avg Temp<br>deg C | Time of<br>Max Temp | Max Temp<br>deg C | Time of<br>Min Temp | Min Temp<br>deg C |
|---------|-------------------|---------------------|-------------------|---------------------|-------------------|
| 1       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 2       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 3       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 4       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 5       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 6       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 7       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 8       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 9       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 10      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 11      | 3.8               | 1812                | 8.1               | 0557                | -0.1              |
| 12      | 5.1               | 1652                | 9.2               | 0537                | 1.2               |
| 13      | 5.6               | 1702                | 9.8               | 0522                | 2.5               |
| 14      | 6.9               | 1702                | 10.5              | 0532                | 3.9               |
| 15      | 5.9               | 1632                | 8.9               | 0627                | 3.8               |
| 16      | 5.8               | 2002                | 7.7               | 0502                | 3.8               |
| 17      | 6.5               | 1757                | 10.2              | 0647                | 4.0               |
| 18      | 8.2               | 1647                | 12.3              | 0602                | 4.8               |
| 19      | 8.2               | 1527                | 11.4              | 0552                | 5.2               |
| 20      | 9.7               | 1737                | 14.1              | 0512                | 5.4               |
| 21      | 9.3               | 1402                | 12.9              | 0712                | 6.5               |
| 22      | 9.6               | 1637                | 13.7              | 0527                | 6.0               |
| 23      | 9.2               | 1432                | 12.1              | 0542                | 7.0               |
| 24      | 8.9               | 1457                | 12.8              | 0442                | 5.8               |
| 25      | 9.8               | 1657                | 13.9              | 0442                | 6.3               |
| 26      | 7.8               | 1732                | 9.8               | 0727                | 6.1               |
| 27      | 9.3               | 1702                | 14.1              | 0522                | 5.3               |
| 28      | 11.2              | 1547                | 15.3              | 0517                | 7.3               |
| 29      | 12.4              | 1807                | 17.2              | 0447                | 7.6               |
| 30      | 15.0              | 1737                | 19.1              | 0542                | 10.8              |
| AVERAGE | 8.4               |                     | 12.2              |                     | 5.2               |
| MAXIMUM | 15.0              |                     | 19.1              |                     | 10.8              |
| MINIMUM | 3.8               |                     | 8.1               |                     | -0.1              |

## ARCTIC NATIONAL WILDLIFE REFUGE

Sikrelurak River

JULY 1990

| DATE    | AVG TEMP<br>DEG C | TIME OF<br>MAX TEMP | MAX TEMP<br>DEG C | TIME OF<br>MIN TEMP | MIN TEMP<br>DEG C |
|---------|-------------------|---------------------|-------------------|---------------------|-------------------|
| 1       | 15.6              | 1632                | 19.6              | 0532                | 11.4              |
| 2       | 14.8              | 1602                | 18.2              | 0547                | 11.9              |
| 3       | 13.4              | 1617                | 16.3              | 0522                | 10.4              |
| 4       | 13.9              | 1717                | 18.0              | 0542                | 10.4              |
| 5       | 14.7              | 1647                | 18.2              | 0537                | 11.5              |
| 6       | 14.8              | 1727                | 18.2              | 0612                | 11.8              |
| 7       | 11.0              | 0002                | 14.4              | 2357                | 7.7               |
| 8       | 7.5               | 1822                | 8.5               | 0717                | 6.5               |
| 9       | 8.1               | 1557                | 11.0              | 0512                | 6.1               |
| 10      | 7.9               | 1712                | 9.5               | 0527                | 6.5               |
| 11      | 8.8               | 1707                | 12.2              | 0632                | 6.8               |
| 12      | 9.8               | 1557                | 12.6              | 0607                | 7.2               |
| 13      | 12.1              | 1657                | 16.5              | 0557                | 8.6               |
| 14      | 12.4              | 1552                | 16.5              | 0617                | 10.0              |
| 15      | 12.0              | 1452                | 14.5              | 0602                | 9.8               |
| 16      | 11.4              | 1557                | 14.4              | 0657                | 8.9               |
| 17      | 11.6              | 1632                | 12.7              | 0352                | 10.4              |
| 18      | 12.3              | 1632                | 14.4              | 0627                | 10.3              |
| 19      | 11.4              | 0002                | 12.9              | 2357                | 10.8              |
| 20      | 12.0              | 1717                | 14.5              | 0502                | 9.8               |
| 21      | 12.5              | 1557                | 14.4              | 0247                | 10.3              |
| 22      | 10.7              | 0002                | 11.6              | 0752                | 10.0              |
| 23      | 13.0              | 1637                | 17.3              | 0532                | 9.3               |
| 24      | 11.1              | 1652                | 12.5              | 2357                | 9.7               |
| 25      | 9.4               | 1802                | 11.2              | 0737                | 8.0               |
| 26      | 10.5              | 1722                | 13.8              | 0527                | 8.0               |
| 27      | 10.5              | 1727                | 13.5              | 0717                | 8.0               |
| 28      | 10.3              | 1707                | 12.8              | 0647                | 8.4               |
| 29      | 10.1              | 1622                | 12.0              | 0612                | 8.6               |
| 30      | 10.9              | 1712                | 14.0              | 0717                | 8.7               |
| 31      | 10.4              | 1757                | 13.2              | 0657                | 8.7               |
| AVERAGE | 11.4              |                     | 14.2              |                     | 9.2               |
| MAXIMUM | 15.6              |                     | 19.6              |                     | 11.9              |
| MINIMUM | 7.5               |                     | 8.5               |                     | 6.1               |

## ARCTIC NATIONAL WILDLIFE REFUGE

## Sikrelurak River

AUGUST 1990

| DATE    | Avg Temp<br>deg C | Time of<br>Max Temp | Max Temp<br>deg C | Time of<br>Min Temp | Min Temp<br>deg C |
|---------|-------------------|---------------------|-------------------|---------------------|-------------------|
| 1       | 10.9              | 1652                | 14.6              | 0532                | 8.0               |
| 2       | 10.7              | 1542                | 13.1              | 0712                | 8.8               |
| 3       | 8.1               | 0002                | 9.8               | 2357                | 7.2               |
| 4       | 8.1               | 1602                | 10.5              | 0557                | 6.4               |
| 5       | 9.0               | 1642                | 12.4              | 0612                | 5.9               |
| 6       | 9.0               | 1612                | 12.1              | 0552                | 6.7               |
| 7       | 8.8               | 1657                | 11.6              | 0622                | 7.1               |
| 8       | 8.0               | 1857                | 9.6               | 0727                | 6.6               |
| 9       | 8.4               | 1727                | 10.4              | 0812                | 6.7               |
| 10      | 8.0               | 1852                | 9.4               | 0822                | 7.1               |
| 11      | 8.2               | 1802                | 11.0              | 0707                | 6.6               |
| 12      | 8.9               | 1822                | 11.7              | 0642                | 6.7               |
| 13      | 9.4               | 1602                | 11.8              | 0652                | 7.6               |
| 14      | 8.1               | 1732                | 10.4              | 0542                | 6.3               |
| 15      | 7.2               | 1552                | 9.8               | 2357                | 5.6               |
| 16      | 6.5               | 1447                | 8.8               | 0552                | 4.4               |
| 17      | 6.9               | 1712                | 10.0              | 0537                | 4.5               |
| 18      | 5.8               | 1717                | 6.7               | 0722                | 5.1               |
| 19      | 6.6               | 1712                | 9.5               | 0602                | 4.4               |
| 20      | 6.1               | 1752                | 7.5               | 0957                | 5.2               |
| 21      | 6.3               | 1717                | 8.9               | 0907                | 4.4               |
| 22      | 5.7               | 1807                | 8.3               | 1002                | 3.3               |
| 23      | 5.1               | 1632                | 6.3               | 2357                | 4.2               |
| 24      | 4.7               | 1722                | 6.7               | 0637                | 3.0               |
| 25      | 4.6               | 1522                | 5.5               | 2357                | 3.0               |
| 26      | 5.2               | 1732                | 8.8               | 0532                | 2.7               |
| 27      | 7.6               | 1727                | 8.6               | 0932                | 6.8               |
| 28      | 6.5               | 1642                | 7.3               | 0912                | 5.7               |
| 29      | 5.2               | 0002                | 6.0               | 0822                | 4.6               |
| 30      | 5.5               | 1827                | 7.0               | 0747                | 4.2               |
| 31      | 5.7               | 1522                | 6.6               | 0802                | 4.9               |
| AVERAGE | 7.3               |                     | 9.4               |                     | 5.6               |
| MAXIMUM | 10.9              |                     | 14.6              |                     | 8.8               |
| MINIMUM | 4.6               |                     | 5.5               |                     | 2.7               |

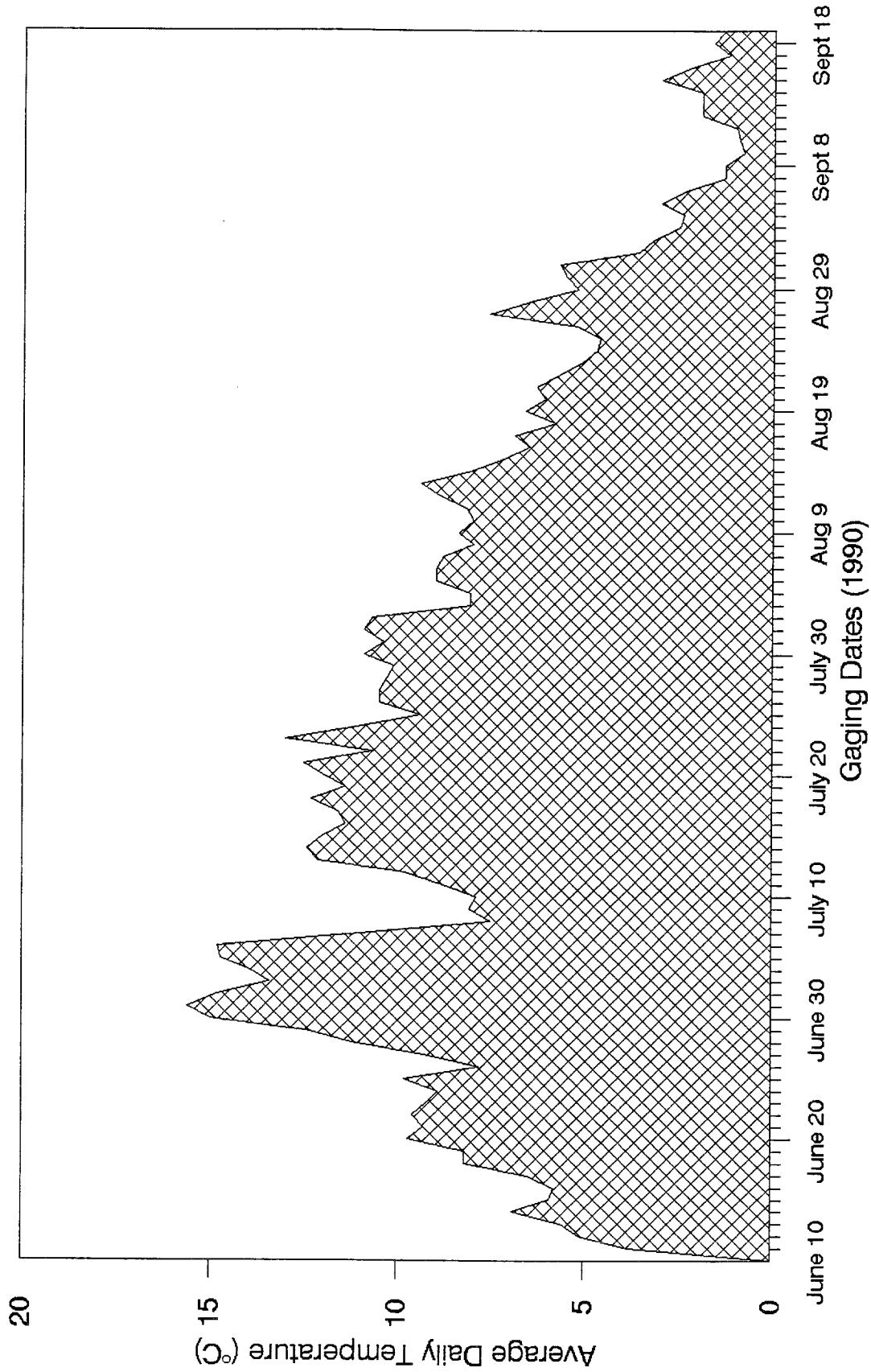
## ARCTIC NATIONAL WILDLIFE REFUGE

Sikrelurak River

SEPTEMBER 1990

| DATE    | Avg Temp<br>deg C | Time of<br>Max Temp | Max Temp<br>deg C | Time of<br>Min Temp | Min Temp<br>deg C |
|---------|-------------------|---------------------|-------------------|---------------------|-------------------|
| 1       | 3.6               | 0002                | 5.2               | 2357                | 2.5               |
| 2       | 3.2               | 1632                | 5.2               | 0702                | 1.7               |
| 3       | 2.5               | 1627                | 5.0               | 0637                | 0.5               |
| 4       | 2.4               | 1517                | 3.4               | 0722                | 1.5               |
| 5       | 3.0               | 1452                | 4.5               | 0717                | 2.0               |
| 6       | 2.3               | 1552                | 2.8               | 2357                | 1.8               |
| 7       | 1.3               | 1732                | 2.4               | 0827                | 0.1               |
| 8       | 1.3               | 1537                | 2.5               | 2357                | 0.3               |
| 9       | 0.8               | 1742                | 2.3               | 0642                | -0.1              |
| 10      | 0.9               | 1732                | 2.9               | 0122                | -0.1              |
| 11      | 1.0               | 1742                | 2.6               | 0242                | -0.1              |
| 12      | 1.9               | 1707                | 4.5               | 0737                | 0.0               |
| 13      | 1.9               | 1702                | 4.3               | 0637                | 0.0               |
| 14      | 1.9               | 1817                | 2.8               | 0802                | 0.7               |
| 15      | 3.0               | 1637                | 4.1               | 0712                | 2.3               |
| 16      | 2.2               | 1642                | 4.3               | 0727                | 0.3               |
| 17      | 1.2               | 1617                | 1.9               | 2352                | 0.6               |
| 18      | 1.6               | 1707                | 3.1               | 0002                | 0.6               |
| 19      | 1.3               | 1527                | 1.9               | 0202                | 0.9               |
| 20      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 21      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 22      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 23      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 24      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 25      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 26      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 27      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 28      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 29      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 30      | - - -             | - - -               | - - -             | - - -               | - - -             |
| AVERAGE | 2.0               |                     | 3.5               |                     | 0.8               |
| MAXIMUM | 3.6               |                     | 5.2               |                     | 2.5               |
| MINIMUM | 0.8               |                     | 1.9               |                     | -0.1              |

Sikrelurak River  
1990



## ARCTIC NATIONAL WILDLIFE REFUGE

## TAMAYARIK RIVER, LOWER WEST FORK

LOCATION.--Lat 69°58'50", long 145°47'40", NW 1/4 NW 1/4 sec 12, T.7N., R.25E., 1.5 miles upstream from the confluence with the Tamayariak River, 54 miles west-southwest of Kaktovik, Alaska.

DRAINAGE AREA.--98.14 mi<sup>2</sup>, of which 5.55 mi<sup>2</sup> are located within the Arctic National Wildlife Refuge Wilderness Area.

PERIOD OF RECORD.--July to Sept. 1988; June to Sept. 1989; June to Sept. 1990.

REMARKS.--This is a 4th Order drainage. Discharge records are initiated during break-up and discontinued at freeze-up of each year.

EXTREME FOR PERIOD OF RECORD.--Maximum Temperature, 16.6°C July 15, 1989.

## JUNE 1990

| DATE    | AVG TEMP<br>DEG C | TIME OF<br>MAX TEMP | MAX TEMP<br>DEG C | TIME OF<br>MIN TEMP | MIN TEMP<br>DEG C |
|---------|-------------------|---------------------|-------------------|---------------------|-------------------|
| 1       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 2       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 3       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 4       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 5       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 6       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 7       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 8       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 9       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 10      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 11      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 12      | 5.6               | 1738                | 9.3               | 0503                | 2.1               |
| 13      | 6.4               | 1558                | 8.5               | 0718                | 4.7               |
| 14      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 15      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 16      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 17      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 18      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 19      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 20      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 21      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 22      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 23      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 24      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 25      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 26      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 27      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 28      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 29      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 30      | - - -             | - - -               | - - -             | - - -               | - - -             |
| AVERAGE | - - -             | - - -               | - - -             | - - -               | - - -             |
| MAXIMUM | - - -             | - - -               | - - -             | - - -               | - - -             |
| MINIMUM | - - -             | - - -               | - - -             | - - -               | - - -             |

ARCTIC NATIONAL WILDLIFE REFUGE  
TAMAYARIK RIVER, LOWER WEST FORK

JULY 1990

| DATE    | AVG TEMP<br>DEG C | TIME OF<br>MAX TEMP | MAX TEMP<br>DEG C | TIME OF<br>MIN TEMP | MIN TEMP<br>DEG C |
|---------|-------------------|---------------------|-------------------|---------------------|-------------------|
| 1       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 2       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 3       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 4       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 5       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 6       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 7       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 8       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 9       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 10      | 6.1               | 1611                | 7.6               | 0511                | 4.9               |
| 11      | 7.6               | 1711                | 10.8              | 0526                | 5.0               |
| 12      | 9.6               | 1731                | 13.2              | 0521                | 6.1               |
| 13      | 9.6               | 1836                | 12.0              | 0356                | 8.0               |
| 14      | 10.8              | 1501                | 13.4              | 0411                | 8.4               |
| 15      | 11.7              | 1606                | 14.4              | 0611                | 9.3               |
| 16      | 11.1              | 1446                | 12.8              | 0621                | 9.4               |
| 17      | 10.4              | 1921                | 11.2              | 2356                | 9.9               |
| 18      | 11.2              | 1621                | 13.4              | 0551                | 9.2               |
| 19      | 11.3              | 1721                | 13.6              | 0501                | 9.3               |
| 20      | 11.7              | 1711                | 13.5              | 0501                | 10.0              |
| 21      | 11.5              | 1516                | 12.7              | 2356                | 10.4              |
| 22      | 10.7              | 1621                | 13.0              | 1011                | 9.4               |
| 23      | 11.8              | 1651                | 14.7              | 0531                | 9.0               |
| 24      | 10.2              | 1416                | 12.5              | 2356                | 8.4               |
| 25      | 7.9               | 1601                | 8.7               | 0551                | 7.2               |
| 26      | 8.7               | 1616                | 11.3              | 0526                | 6.7               |
| 27      | 8.3               | 1446                | 10.8              | 0531                | 6.3               |
| 28      | 7.5               | 1536                | 8.8               | 0711                | 6.5               |
| 29      | 8.2               | 1821                | 10.8              | 0531                | 6.7               |
| 30      | 8.6               | 1731                | 10.9              | 0611                | 7.1               |
| 31      | 8.2               | 1716                | 11.0              | 0441                | 6.5               |
| AVERAGE | 9.7               |                     | 11.9              |                     | 7.9               |
| MAXIMUM | 11.8              |                     | 14.7              |                     | 10.4              |
| MINIMUM | 6.1               |                     | 7.6               |                     | 4.9               |

ARCTIC NATIONAL WILDLIFE REFUGE  
TAMAYARIAK RIVER, LOWER WEST FORK

AUGUST 1990

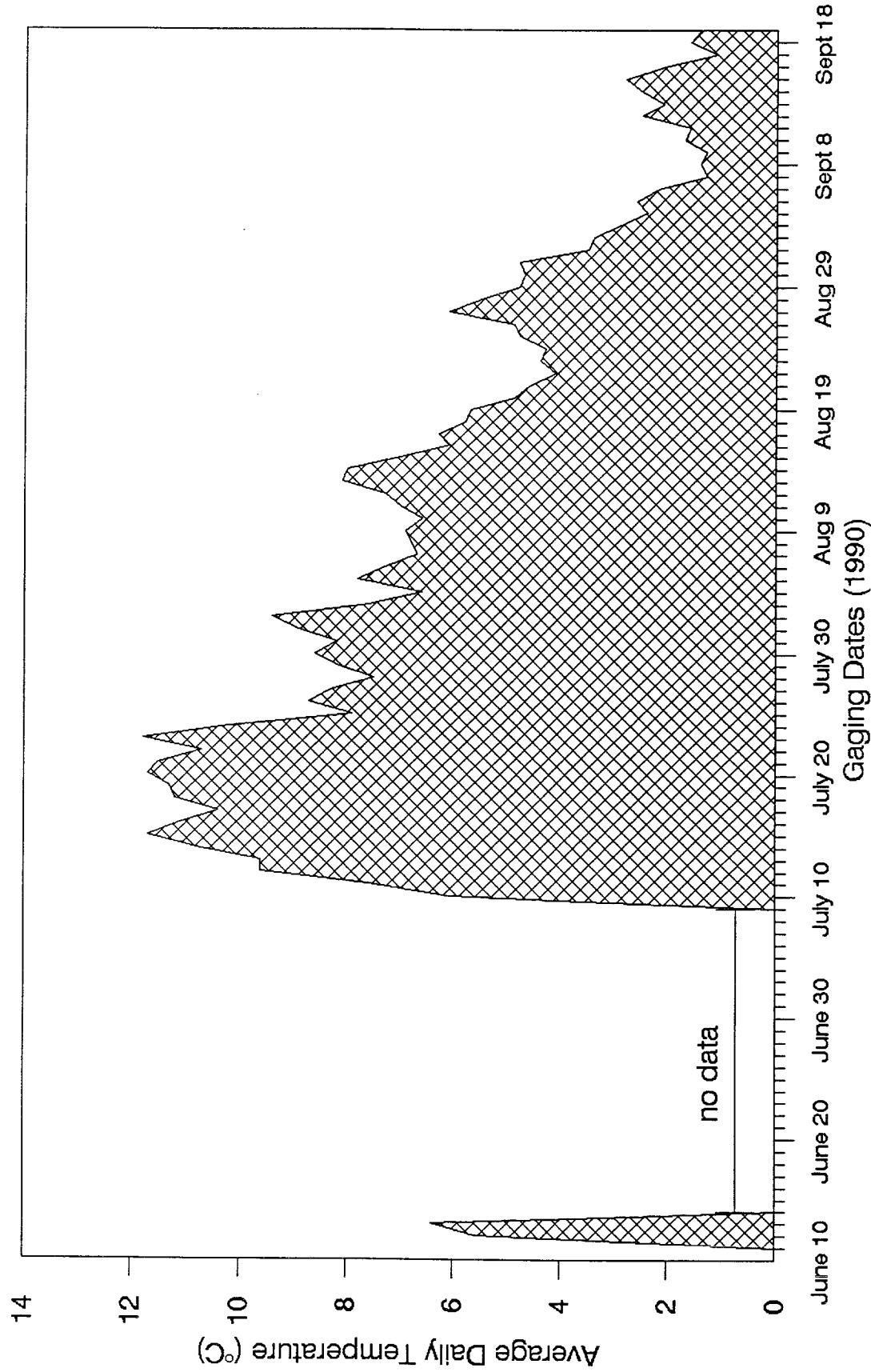
| DATE    | Avg Temp<br>deg C | Time of<br>Max Temp | Max Temp<br>deg C | Time of<br>Min Temp | Min Temp<br>deg C |
|---------|-------------------|---------------------|-------------------|---------------------|-------------------|
| 1       | 8.9               | 1656                | 12.0              | 0526                | 6.1               |
| 2       | 9.4               | 1536                | 12.1              | 0616                | 7.2               |
| 3       | 7.6               | 0001                | 8.6               | 2356                | 6.6               |
| 4       | 6.6               | 1446                | 8.1               | 0416                | 5.2               |
| 5       | 7.8               | 1631                | 10.3              | 0651                | 5.7               |
| 6       | 7.3               | 1656                | 8.7               | 0601                | 6.2               |
| 7       | 6.7               | 1756                | 7.9               | 0556                | 5.8               |
| 8       | 6.8               | 1756                | 8.0               | 0636                | 5.8               |
| 9       | 6.9               | 1611                | 8.4               | 0641                | 5.7               |
| 10      | 6.6               | 1631                | 8.2               | 0621                | 5.6               |
| 11      | 7.0               | 1511                | 9.2               | 0646                | 5.4               |
| 12      | 7.3               | 1546                | 10.1              | 0601                | 5.0               |
| 13      | 8.1               | 1556                | 10.4              | 0616                | 6.6               |
| 14      | 8.0               | 1626                | 10.2              | 0606                | 6.6               |
| 15      | 7.0               | 1701                | 8.7               | 2356                | 5.8               |
| 16      | 6.1               | 1726                | 6.8               | 2356                | 5.2               |
| 17      | 6.3               | 1641                | 8.7               | 0546                | 4.9               |
| 18      | 5.8               | 1706                | 6.7               | 2356                | 5.2               |
| 19      | 5.7               | 1626                | 7.5               | 0701                | 4.6               |
| 20      | 4.9               | 1631                | 6.3               | 0626                | 4.2               |
| 21      | 4.6               | 1441                | 6.1               | 0746                | 3.4               |
| 22      | 4.1               | 1641                | 6.6               | 0711                | 2.2               |
| 23      | 4.4               | 1726                | 6.3               | 0806                | 2.7               |
| 24      | 4.3               | 1621                | 6.3               | 0746                | 2.6               |
| 25      | 4.8               | 1621                | 7.0               | 0736                | 3.6               |
| 26      | 4.9               | 1631                | 7.8               | 0451                | 3.3               |
| 27      | 6.1               | 1721                | 7.0               | 0846                | 5.4               |
| 28      | 5.5               | 1516                | 6.5               | 0651                | 4.7               |
| 29      | 4.8               | 1716                | 5.4               | 0741                | 4.3               |
| 30      | 4.7               | 1536                | 5.7               | 0556                | 4.0               |
| 31      | 4.8               | 1441                | 5.5               | 0716                | 4.1               |
| AVERAGE | 6.3               |                     | 8.0               |                     | 5.0               |
| MAXIMUM | 9.4               |                     | 12.1              |                     | 7.2               |
| MINIMUM | 4.1               |                     | 5.4               |                     | 2.2               |

ARCTIC NATIONAL WILDLIFE REFUGE  
TAMAYARIK RIVER, LOWER WEST FORK

SEPTEMBER 1990

| DATE    | Avg Temp<br>deg C | Time of<br>Max Temp | Max Temp<br>deg C | Time of<br>Min Temp | Min Temp<br>deg C |
|---------|-------------------|---------------------|-------------------|---------------------|-------------------|
| 1       | 3.5               | 0031                | 4.9               | 0911                | 2.4               |
| 2       | 3.4               | 1541                | 4.4               | 0841                | 2.7               |
| 3       | 2.9               | 1531                | 4.8               | 0721                | 1.3               |
| 4       | 2.4               | 1541                | 3.6               | 0741                | 1.2               |
| 5       | 2.6               | 1526                | 3.5               | 0706                | 1.9               |
| 6       | 2.2               | 1401                | 3.0               | 2356                | 1.6               |
| 7       | 1.3               | 1756                | 2.1               | 0751                | 0.4               |
| 8       | 1.4               | 1436                | 2.2               | 2356                | 1.0               |
| 9       | 1.3               | 1656                | 3.0               | 0746                | 0.3               |
| 10      | 1.7               | 1646                | 3.7               | 0601                | 0.4               |
| 11      | 1.6               | 1556                | 3.4               | 0506                | 0.2               |
| 12      | 2.5               | 1621                | 4.6               | 0741                | 1.2               |
| 13      | 2.1               | 1716                | 4.6               | 0751                | 0.2               |
| 14      | 2.5               | 1651                | 3.8               | 0736                | 1.4               |
| 15      | 2.8               | 1746                | 3.6               | 0831                | 1.8               |
| 16      | 2.1               | 1631                | 3.9               | 0751                | 0.8               |
| 17      | 1.1               | 1626                | 2.0               | 0736                | 0.4               |
| 18      | 1.6               | 1646                | 3.5               | 0131                | 0.4               |
| 19      | 1.4               | 1556                | 1.9               | 2356                | 0.9               |
| 20      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 21      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 22      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 23      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 24      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 25      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 26      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 27      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 28      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 29      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 30      | - - -             | - - -               | - - -             | - - -               | - - -             |
| AVERAGE | 2.1               |                     | 3.5               |                     | 1.2               |
| MAXIMUM | 3.5               |                     | 4.9               |                     | 2.7               |
| MINIMUM | 1.1               |                     | 1.9               |                     | 0.2               |

Lower West Fork Tamayariak River  
1990



## ARCTIC NATIONAL WILDLIFE REFUGE

## Tamayariak River, Middle Fork

LOCATION.-Lat 69°58'33", long 145°46'44", in center sec 12, T.7N., R.25E., 0.4 miles upstream from the confluence with the West Fork Tamayariak River, 54 miles west-southwest of Kaktovik, Alaska.

DRAINAGE AREA.-61.3 mi<sup>2</sup>, of which 0.79 mi<sup>2</sup> are located within the Arctic National Wildlife Wilderness Area.

PERIOD OF RECORD.--July to Sept. 1988; June to Sept. 1989; June to Sept. 1990.

REMARKS.-This is a 4th Order drainage. Discharge records are initiated during break-up and discontinued at freeze-up of each year.

EXTREME FOR PERIOD OF RECORD.-Maximum Temperature, 19.9°C July 3, 1990.

## JUNE 1990

| DATE    | Avg Temp<br>deg C | Time of<br>Max Temp | Max Temp<br>deg C | Time of<br>Min Temp | Min Temp<br>deg C |
|---------|-------------------|---------------------|-------------------|---------------------|-------------------|
| 1       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 2       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 3       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 4       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 5       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 6       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 7       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 8       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 9       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 10      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 11      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 12      | 6.7               | 1735                | 10.7              | 0605                | 2.7               |
| 13      | 7.2               | 1700                | 9.3               | 0740                | 5.2               |
| 14      | 7.6               | 1700                | 11.0              | 0605                | 4.4               |
| 15      | 7.4               | 1410                | 9.9               | 0620                | 5.6               |
| 16      | 7.0               | 2100                | 9.1               | 0640                | 4.9               |
| 17      | 8.6               | 1800                | 12.0              | 0700                | 5.7               |
| 18      | 9.6               | 1850                | 13.2              | 0545                | 6.1               |
| 19      | 9.9               | 1715                | 12.6              | 0630                | 7.4               |
| 20      | 10.4              | 1725                | 13.9              | 0625                | 7.1               |
| 21      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 22      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 23      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 24      | 9.0               | 1929                | 12.3              | 0539                | 5.7               |
| 25      | 11.3              | 1629                | 14.9              | 0549                | 8.1               |
| 26      | 9.7               | 1644                | 12.4              | 0649                | 7.5               |
| 27      | 10.7              | 1824                | 14.7              | 0539                | 7.0               |
| 28      | 12.7              | 1719                | 16.2              | 0639                | 9.4               |
| 29      | 13.0              | 1349                | 15.9              | 0549                | 9.9               |
| 30      | 13.6              | 1659                | 17.3              | 0604                | 10.2              |
| AVERAGE | 9.7               |                     | 12.8              |                     | 6.7               |
| MAXIMUM | 13.6              |                     | 17.3              |                     | 10.2              |
| MINIMUM | 6.7               |                     | 9.1               |                     | 2.7               |

ARCTIC NATIONAL WILDLIFE REFUGE  
Tamayariak River, Middle Fork

JULY 1990

| DATE    | Avg Temp<br>deg C | Time of<br>Max Temp | Max Temp<br>deg C | Time of<br>Min Temp | Min Temp<br>deg C |
|---------|-------------------|---------------------|-------------------|---------------------|-------------------|
| 1       | 14.0              | 1724                | 17.4              | 0559                | 10.7              |
| 2       | 14.2              | 1619                | 17.9              | 0614                | 10.6              |
| 3       | 15.7              | 1709                | 19.9              | 0544                | 11.9              |
| 4       | 15.2              | 1629                | 18.6              | 0554                | 12.3              |
| 5       | 15.2              | 1719                | 19.1              | 0554                | 11.6              |
| 6       | 15.7              | 1754                | 19.3              | 0609                | 12.2              |
| 7       | 11.2              | 0004                | 16.7              | 2354                | 8.1               |
| 8       | 7.4               | 1604                | 8.2               | 2354                | 6.1               |
| 9       | 6.2               | 1659                | 7.4               | 0544                | 5.3               |
| 10      | 6.9               | 1614                | 8.8               | 0529                | 5.5               |
| 11      | 8.9               | 1644                | 13.1              | 0534                | 5.6               |
| 12      | 11.4              | 1704                | 15.9              | 0554                | 7.2               |
| 13      | 11.4              | 1839                | 14.3              | 0614                | 9.5               |
| 14      | 12.9              | 1449                | 17.0              | 0724                | 9.9               |
| 15      | 13.5              | 1529                | 17.0              | 0724                | 11.0              |
| 16      | 12.6              | 1459                | 14.8              | 0514                | 10.6              |
| 17      | 11.7              | 1929                | 12.7              | 2359                | 11.1              |
| 18      | 12.8              | 1614                | 15.8              | 0454                | 10.5              |
| 19      | 13.0              | 1729                | 16.0              | 0449                | 10.5              |
| 20      | 13.4              | 1729                | 15.6              | 0439                | 11.4              |
| 21      | 12.8              | 1534                | 14.1              | 2359                | 11.5              |
| 22      | 12.0              | 1639                | 15.1              | 0954                | 10.5              |
| 23      | 13.4              | 1644                | 17.2              | 0534                | 10.0              |
| 24      | 11.4              | 1349                | 14.7              | 2359                | 9.2               |
| 25      | 8.9               | 1554                | 10.0              | 0539                | 7.7               |
| 26      | 10.0              | 1629                | 13.9              | 0444                | 7.3               |
| 27      | 9.4               | 1454                | 13.1              | 0514                | 6.7               |
| 28      | 8.3               | 1539                | 10.1              | 0624                | 7.0               |
| 29      | 9.2               | 1644                | 13.4              | 0534                | 7.1               |
| 30      | 9.7               | 1719                | 13.3              | 0529                | 7.6               |
| 31      | 9.3               | 1649                | 13.6              | 0419                | 6.5               |
| AVERAGE | 11.5              |                     | 14.6              |                     | 9.1               |
| MAXIMUM | 15.7              |                     | 19.9              |                     | 12.3              |
| MINIMUM | 6.2               |                     | 7.4               |                     | 5.3               |

ARCTIC NATIONAL WILDLIFE REFUGE  
Tamayariak River, Middle Fork

AUGUST 1990

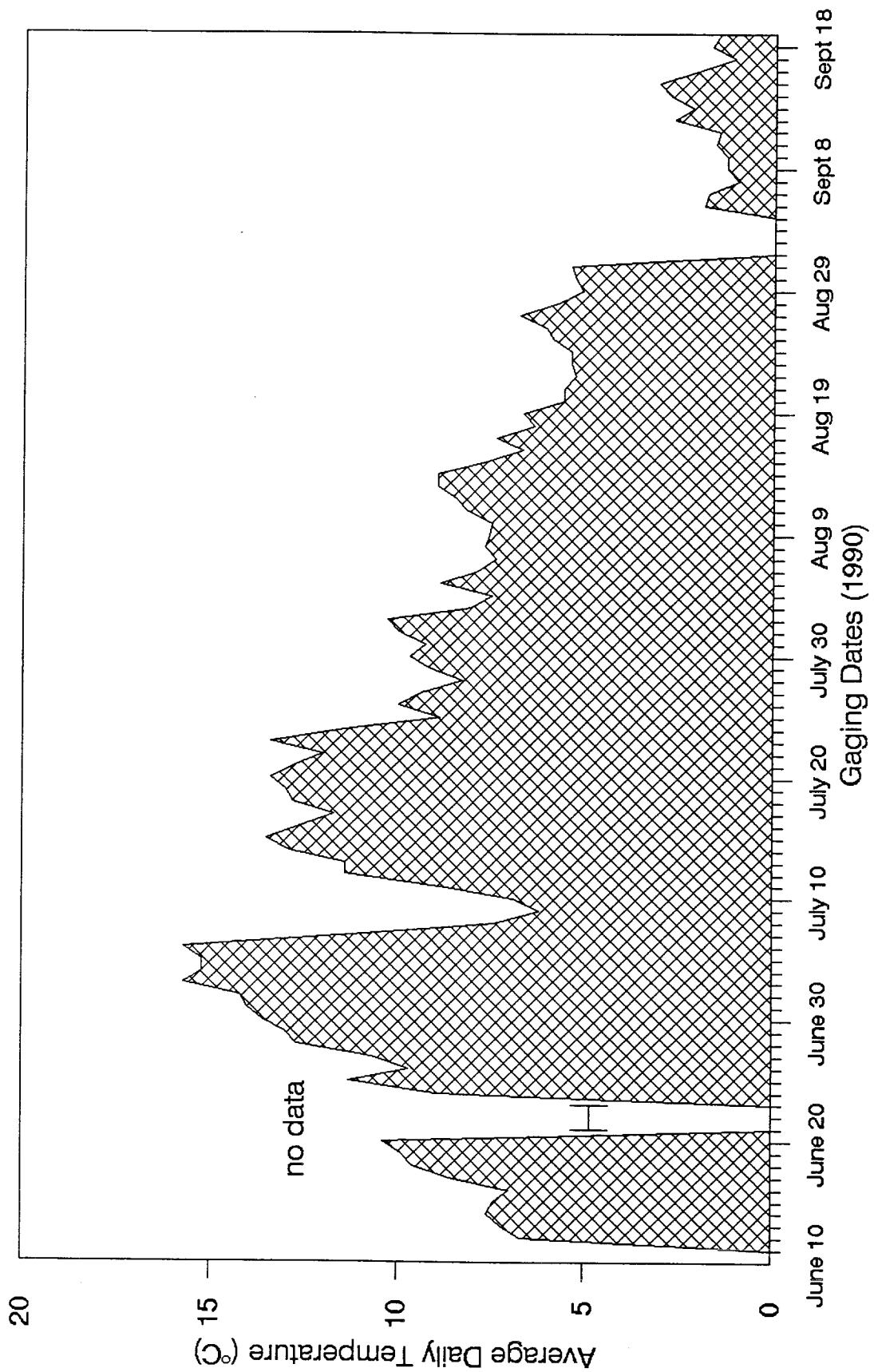
| DATE    | Avg Temp<br>deg C | Time of<br>Max Temp | Max Temp<br>deg C | Time of<br>Min Temp | Min Temp<br>deg C |
|---------|-------------------|---------------------|-------------------|---------------------|-------------------|
| 1       | 10.0              | 1629                | 14.7              | 0459                | 6.1               |
| 2       | 10.3              | 1514                | 14.3              | 0609                | 7.4               |
| 3       | 8.1               | 1609                | 8.8               | 2359                | 7.2               |
| 4       | 7.5               | 1509                | 9.8               | 0434                | 5.4               |
| 5       | 8.9               | 1514                | 13.0              | 0709                | 5.8               |
| 6       | 7.9               | 1719                | 10.1              | 0419                | 6.3               |
| 7       | 7.4               | 1754                | 9.0               | 0454                | 6.0               |
| 8       | 7.7               | 1744                | 9.9               | 0614                | 6.0               |
| 9       | 7.6               | 1634                | 9.9               | 0609                | 6.0               |
| 10      | 7.5               | 1634                | 10.1              | 0414                | 5.8               |
| 11      | 8.2               | 1454                | 12.6              | 0549                | 5.5               |
| 12      | 8.5               | 1554                | 13.5              | 0624                | 4.6               |
| 13      | 9.0               | 1539                | 13.2              | 0554                | 6.6               |
| 14      | 9.0               | 1524                | 13.1              | 0614                | 6.7               |
| 15      | 7.7               | 1644                | 10.6              | 2359                | 6.0               |
| 16      | 6.7               | 1719                | 8.1               | 2359                | 5.4               |
| 17      | 7.4               | 1544                | 11.6              | 0239                | 5.0               |
| 18      | 6.4               | 1704                | 7.9               | 0119                | 5.4               |
| 19      | 6.7               | 1519                | 10.1              | 2359                | 4.8               |
| 20      | 5.6               | 1624                | 8.1               | 0429                | 4.2               |
| 21      | 5.6               | 1614                | 8.7               | 0649                | 3.3               |
| 22      | 5.3               | 1514                | 10.6              | 0639                | 1.0               |
| 23      | 5.4               | 1519                | 9.5               | 0739                | 1.9               |
| 24      | 5.4               | 1324                | 9.4               | 0714                | 1.9               |
| 25      | 5.9               | 1539                | 9.7               | 0814                | 3.5               |
| 26      | 6.1               | 1529                | 11.6              | 0524                | 3.0               |
| 27      | 6.8               | 1729                | 7.9               | 2359                | 5.8               |
| 28      | 5.8               | 1239                | 7.4               | 0629                | 4.7               |
| 29      | 5.1               | 1704                | 6.1               | 0719                | 4.5               |
| 30      | 5.3               | 1544                | 6.8               | 0144                | 4.3               |
| 31      | 5.4               | 1904                | 7.0               | 0649                | 4.4               |
| AVERAGE | 7.1               |                     | 10.1              |                     | 5.0               |
| MAXIMUM | 10.3              |                     | 14.7              |                     | 7.4               |
| MINIMUM | 5.1               |                     | 6.1               |                     | 1.0               |

ARCTIC NATIONAL WILDLIFE REFUGE  
Tamayariak River, Middle Fork

SEPTEMBER 1990

| DATE    | AVG TEMP<br>DEG C | TIME OF<br>MAX TEMP | MAX TEMP<br>DEG C | TIME OF<br>MIN TEMP | MIN TEMP<br>DEG C |
|---------|-------------------|---------------------|-------------------|---------------------|-------------------|
| 1       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 2       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 3       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 4       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 5       | 1.9               | 1224                | 6.0               | 0319                | 0.1               |
| 6       | 1.8               | 1524                | 2.5               | 0019                | 0.6               |
| 7       | 1.0               | 1839                | 1.8               | 0814                | 0.1               |
| 8       | 1.3               | 1439                | 2.1               | 0714                | 0.8               |
| 9       | 1.3               | 1729                | 3.1               | 0804                | 0.1               |
| 10      | 1.6               | 1719                | 3.8               | 0629                | 0.3               |
| 11      | 1.5               | 1554                | 3.3               | 0519                | 0.0               |
| 12      | 2.7               | 1709                | 4.9               | 0749                | 1.2               |
| 13      | 2.2               | 1739                | 4.8               | 0754                | 0.0               |
| 14      | 2.8               | 1649                | 4.1               | 0739                | 1.5               |
| 15      | 3.1               | 1744                | 3.9               | 0834                | 2.1               |
| 16      | 2.1               | 1659                | 4.2               | 0834                | 0.4               |
| 17      | 1.1               | 1629                | 2.3               | 0809                | 0.2               |
| 18      | 1.7               | 1644                | 3.6               | 0104                | 0.4               |
| 19      | 1.5               | 1619                | 2.0               | 0844                | 1.0               |
| 20      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 21      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 22      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 23      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 24      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 25      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 26      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 27      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 28      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 29      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 30      | - - -             | - - -               | - - -             | - - -               | - - -             |
| AVERAGE | 1.8               |                     | 3.5               |                     | 0.6               |
| MAXIMUM | 3.1               |                     | 6.0               |                     | 2.1               |
| MINIMUM | 1.0               |                     | 1.8               |                     | 0.0               |

Middle Fork Tamayariak River  
1990



## ARCTIC NATIONAL WILDLIFE REFUGE

## TAMAYARIK RIVER, UPPER WEST FORK

LOCATION.--Lat  $69^{\circ}49'58''$ , long  $145^{\circ}55'15''$ , in the center  $W\frac{1}{4}N\frac{1}{2}$  sec 33, T.6N., R.25E., 13.9 miles upstream from the confluence with the Tamayariak River, 61.1 miles west-southwest of Kaktovik, Alaska.

DRAINAGE AREA.-- $49.2 \text{ mi}^2$ , of which  $5.6 \text{ mi}^2$  are located within the Arctic National Wildlife Refuge Wilderness Area.

PERIOD OF RECORD.--July to Sept. 1988; June to Sept. 1989; June to Sept. 1990.

REMARKS.--This is a 4th Order drainage. Discharge records are initiated during break-up and discontinued at freeze-up of each year.

EXTREME FOR PERIOD OF RECORD.--Maximum Temperature,  $20.7^{\circ}\text{C}$  July 5, 1990.

## JUNE 1990

| DATE    | Avg Temp<br>deg C | Time of<br>Max Temp | Max Temp<br>deg C | Time of<br>Min Temp | Min Temp<br>deg C |
|---------|-------------------|---------------------|-------------------|---------------------|-------------------|
| 1       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 2       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 3       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 4       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 5       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 6       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 7       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 8       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 9       | - - -             | - - -               | - - -             | - - -               | - - -             |
| 10      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 11      | - - -             | - - -               | - - -             | - - -               | - - -             |
| 12      | 7.3               | 1718                | 11.4              | 0613                | 3.5               |
| 13      | 8.4               | 1603                | 10.5              | 0628                | 6.6               |
| 14      | 8.9               | 1808                | 12.1              | 0618                | 6.0               |
| 15      | 9.0               | 1328                | 11.2              | 0648                | 7.5               |
| 16      | 8.5               | 2108                | 10.3              | 0538                | 6.6               |
| 17      | 10.1              | 1803                | 13.7              | 0853                | 7.1               |
| 18      | 11.5              | 1918                | 13.9              | 0603                | 8.8               |
| 19      | 11.4              | 1713                | 13.3              | 0548                | 9.6               |
| 20      | 11.5              | 1918                | 13.6              | 0538                | 9.0               |
| 21      | 10.6              | 1923                | 12.1              | 0528                | 9.3               |
| 22      | 12.2              | 1723                | 15.5              | 0628                | 9.0               |
| 23      | 10.5              | 0008                | 13.4              | 2353                | 8.7               |
| 24      | 10.2              | 1938                | 13.2              | 0628                | 7.4               |
| 25      | 12.6              | 1743                | 15.8              | 0623                | 9.5               |
| 26      | 12.3              | 1723                | 14.7              | 0838                | 10.2              |
| 27      | 12.6              | 1843                | 15.5              | 0628                | 10.0              |
| 28      | 14.4              | 1633                | 17.1              | 0538                | 12.2              |
| 29      | 14.5              | 1428                | 16.4              | 0553                | 12.4              |
| 30      | 15.3              | 1808                | 18.4              | 0558                | 12.4              |
| AVERAGE | 11.1              |                     | 13.8              |                     | 8.7               |
| MAXIMUM | 15.3              |                     | 18.4              |                     | 12.4              |
| MINIMUM | 7.3               |                     | 10.3              |                     | 3.5               |

ARCTIC NATIONAL WILDLIFE REFUGE  
TAMAYARIAK RIVER, UPPER WEST FORK

JULY 1990

| DATE    | AVG TEMP<br>DEG C | TIME OF<br>MAX TEMP | MAX TEMP<br>DEG C | TIME OF<br>MIN TEMP | MIN TEMP<br>DEG C |
|---------|-------------------|---------------------|-------------------|---------------------|-------------------|
| 1       | 16.0              | 1803                | 18.5              | 0638                | 13.3              |
| 2       | 16.1              | 1803                | 18.7              | 0643                | 13.7              |
| 3       | 16.6              | 1933                | 19.5              | 0533                | 14.6              |
| 4       | 17.1              | 1743                | 19.6              | 0553                | 15.2              |
| 5       | 17.5              | 1758                | 20.7              | 0623                | 15.1              |
| 6       | 17.4              | 1913                | 19.7              | 0643                | 15.5              |
| 7       | 15.1              | 0003                | 18.5              | 2343                | 11.0              |
| 8       | 9.4               | 0038                | 11.2              | 2353                | 7.5               |
| 9       | 7.3               | 1738                | 8.1               | 0648                | 6.6               |
| 10      | 8.0               | 1458                | 9.1               | 0428                | 6.9               |
| 11      | 9.5               | 1848                | 12.6              | 0603                | 7.2               |
| 12      | 10.9              | 1908                | 13.7              | 0523                | 8.7               |
| 13      | 12.2              | 1823                | 14.8              | 0618                | 11.1              |
| 14      | 13.5              | 1523                | 15.8              | 0728                | 12.0              |
| 15      | 14.1              | 1708                | 16.2              | 0713                | 13.0              |
| 16      | 13.5              | 1623                | 14.6              | 0708                | 12.5              |
| 17      | 12.8              | 0013                | 13.5              | 0523                | 12.4              |
| 18      | 12.8              | 1938                | 14.5              | 0433                | 11.9              |
| 19      | 13.6              | 1158                | 14.8              | 0523                | 12.5              |
| 20      | 14.0              | 1858                | 15.5              | 0433                | 12.8              |
| 21      | 13.8              | 1713                | 14.7              | 2338                | 13.0              |
| 22      | 13.1              | 1753                | 14.7              | 0843                | 12.3              |
| 23      | 13.6              | 1543                | 15.9              | 0633                | 11.9              |
| 24      | 12.9              | 1523                | 15.2              | 2358                | 11.4              |
| 25      | 10.4              | 0003                | 11.3              | 2358                | 9.3               |
| 26      | 9.7               | 1723                | 11.7              | 0618                | 8.4               |
| 27      | 9.0               | 1628                | 10.7              | 0558                | 7.6               |
| 28      | 8.7               | 1613                | 10.2              | 0738                | 7.8               |
| 29      | 9.0               | 1843                | 10.8              | 0513                | 7.9               |
| 30      | 9.7               | 1728                | 12.1              | 0738                | 8.3               |
| 31      | 9.7               | 1758                | 11.8              | 0528                | 8.4               |
| AVERAGE | 12.5              |                     | 14.5              |                     | 11.0              |
| MAXIMUM | 17.5              |                     | 20.7              |                     | 15.5              |
| MINIMUM | 7.3               |                     | 8.1               |                     | 6.6               |

ARCTIC NATIONAL WILDLIFE REFUGE  
TAMAYARIAK RIVER, UPPER WEST FORK

AUGUST 1990

| DATE    | AVG TEMP<br>DEG C | TIME OF<br>MAX TEMP | MAX TEMP<br>DEG C | TIME OF<br>MIN TEMP | MIN<br>DISCH. |
|---------|-------------------|---------------------|-------------------|---------------------|---------------|
| 1       | 9.0               | 1948                | 11.4              | 0638                | 7.8           |
| 2       | 10.4              | 1753                | 13.2              | 0633                | 8.6           |
| 3       | 9.3               | 0003                | 10.4              | 0928                | 8.8           |
| 4       | 8.6               | 1733                | 9.6               | 2358                | 7.8           |
| 5       | 8.8               | 1823                | 11.8              | 0853                | 6.8           |
| 6       | 9.4               | 1633                | 11.9              | 0843                | 7.7           |
| 7       | 9.0               | 1723                | 10.5              | 0918                | 8.0           |
| 8       | 8.6               | 1948                | 9.5               | 0843                | 7.9           |
| 9       | 8.3               | 2008                | 9.9               | 0743                | 7.6           |
| 10      | 8.5               | 1908                | 10.5              | 0858                | 7.5           |
| 11      | 8.1               | 2103                | 10.3              | 1043                | 7.2           |
| 12      | 7.9               | 2218                | 9.3               | 0803                | 6.9           |
| 13      | 9.4               | 1853                | 12.4              | 1008                | 7.6           |
| 14      | 9.5               | 2123                | 10.8              | 0843                | 8.5           |
| 15      | 9.6               | 1913                | 10.9              | 0948                | 8.7           |
| 16      | 8.7               | 2038                | 9.6               | 1023                | 8.2           |
| 17      | 8.9               | 1903                | 11.0              | 0858                | 7.6           |
| 18      | 8.3               | 0003                | 9.4               | 1038                | 7.6           |
| 19      | 7.9               | 1723                | 9.4               | 0918                | 7.0           |
| 20      | 6.6               | 0003                | 7.3               | 2358                | 6.1           |
| 21      | 6.0               | 1823                | 7.3               | 0903                | 5.2           |
| 22      | 5.6               | 1903                | 7.2               | 0938                | 4.2           |
| 23      | 5.6               | 1833                | 7.3               | 1018                | 4.2           |
| 24      | 5.3               | 1928                | 6.2               | 0918                | 4.3           |
| 25      | 5.5               | 1858                | 6.9               | 0808                | 4.4           |
| 26      | 5.8               | 1818                | 7.2               | 0703                | 4.9           |
| 27      | 7.0               | 1753                | 7.5               | 1023                | 6.6           |
| 28      | 6.3               | 0003                | 6.9               | 2358                | 5.8           |
| 29      | 5.0               | 0003                | 5.8               | 0903                | 4.4           |
| 30      | 4.8               | 1828                | 5.5               | 0613                | 4.1           |
| 31      | 5.2               | 1613                | 6.0               | 0803                | 4.5           |
| AVERAGE | 7.6               |                     | 9.1               |                     | 6.7           |
| MAXIMUM | 10.4              |                     | 13.2              |                     | 8.8           |
| MINIMUM | 4.8               |                     | 5.5               |                     | 4.1           |

ARCTIC NATIONAL WILDLIFE REFUGE  
TAMAYARIAK RIVER, UPPER WEST FORK

SEPTEMBER 1990

| DATE    | Avg Temp<br>Deg C | Time of<br>Max Temp | Max Temp<br>Deg C | Time of<br>Min Temp | Min<br>Disch.<br>Cu. ft/sec |
|---------|-------------------|---------------------|-------------------|---------------------|-----------------------------|
| 1       | 3.1               | 0003                | 5.1               | 2358                | 2.1                         |
| 2       | 2.0               | 1703                | 3.6               | 0713                | 0.7                         |
| 3       | 1.5               | 1653                | 3.5               | 0623                | -0.1                        |
| 4       | 1.4               | 1738                | 2.8               | 0803                | 0.1                         |
| 5       | 2.2               | 1713                | 3.9               | 0738                | 0.8                         |
| 6       | 1.4               | 0003                | 2.6               | 2338                | 0.6                         |
| 7       | 0.4               | 1853                | 1.0               | 0733                | -0.1                        |
| 8       | 0.7               | 1743                | 1.5               | 0743                | 0.1                         |
| 9       | 0.6               | 1748                | 1.7               | 1038                | 0.0                         |
| 10      | 0.7               | 1803                | 2.0               | 0758                | 0.0                         |
| 11      | 0.7               | 1738                | 1.8               | 1138                | 0.1                         |
| 12      | 1.7               | 1833                | 3.5               | 0808                | 0.5                         |
| 13      | 1.6               | 1908                | 3.1               | 1008                | 0.3                         |
| 14      | 2.4               | 1838                | 3.6               | 0818                | 1.3                         |
| 15      | 2.6               | 0003                | 3.3               | 2358                | 1.4                         |
| 16      | 1.1               | 1753                | 2.7               | 0918                | 0.0                         |
| 17      | 0.5               | 1738                | 1.2               | 1028                | 0.0                         |
| 18      | 0.8               | 1753                | 2.3               | 0933                | 0.0                         |
| 19      | 0.7               | 1743                | 1.2               | 0943                | 0.2                         |
| 20      | - - -             | - - -               | - - -             | - - -               | - - -                       |
| 21      | - - -             | - - -               | - - -             | - - -               | - - -                       |
| 22      | - - -             | - - -               | - - -             | - - -               | - - -                       |
| 23      | - - -             | - - -               | - - -             | - - -               | - - -                       |
| 24      | - - -             | - - -               | - - -             | - - -               | - - -                       |
| 25      | - - -             | - - -               | - - -             | - - -               | - - -                       |
| 26      | - - -             | - - -               | - - -             | - - -               | - - -                       |
| 27      | - - -             | - - -               | - - -             | - - -               | - - -                       |
| 28      | - - -             | - - -               | - - -             | - - -               | - - -                       |
| 29      | - - -             | - - -               | - - -             | - - -               | - - -                       |
| 30      | - - -             | - - -               | - - -             | - - -               | - - -                       |
| AVERAGE | 1.4               |                     | 2.7               |                     | 0.4                         |
| MAXIMUM | 3.1               |                     | 5.1               |                     | 2.1                         |
| MINIMUM | 0.4               |                     | 1.0               |                     | -0.1                        |

Upper West Fork Tamayariak River  
1990

